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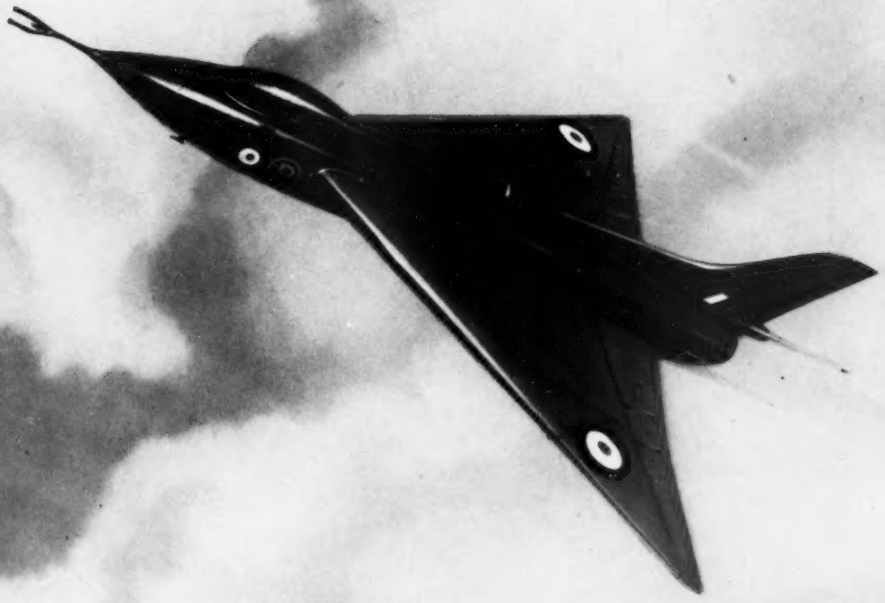

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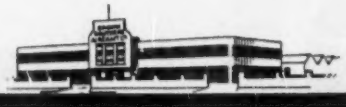

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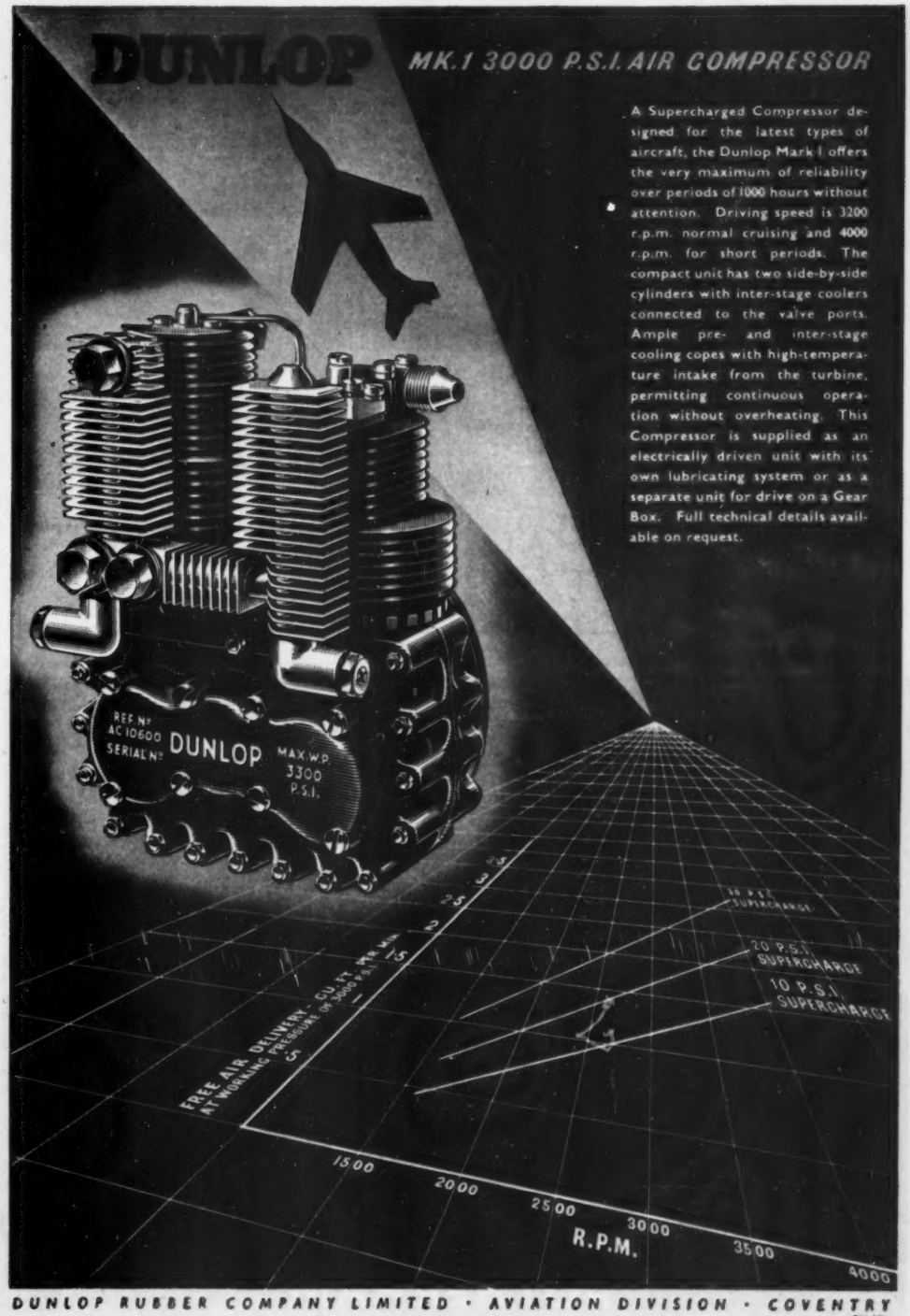

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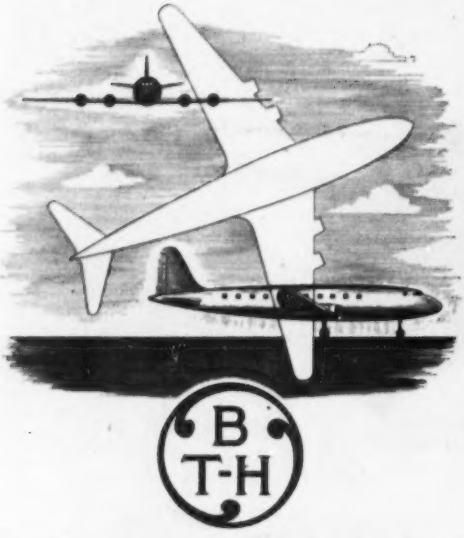

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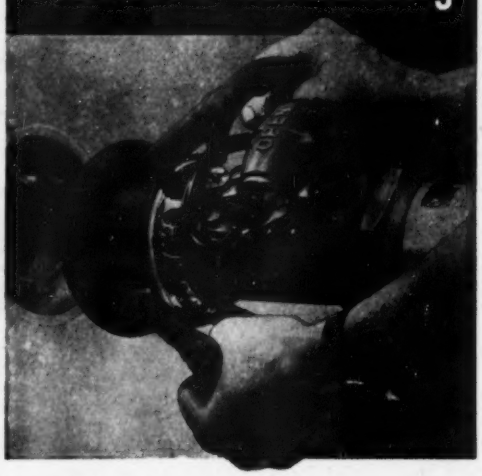

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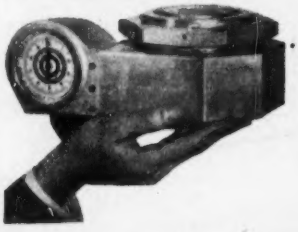

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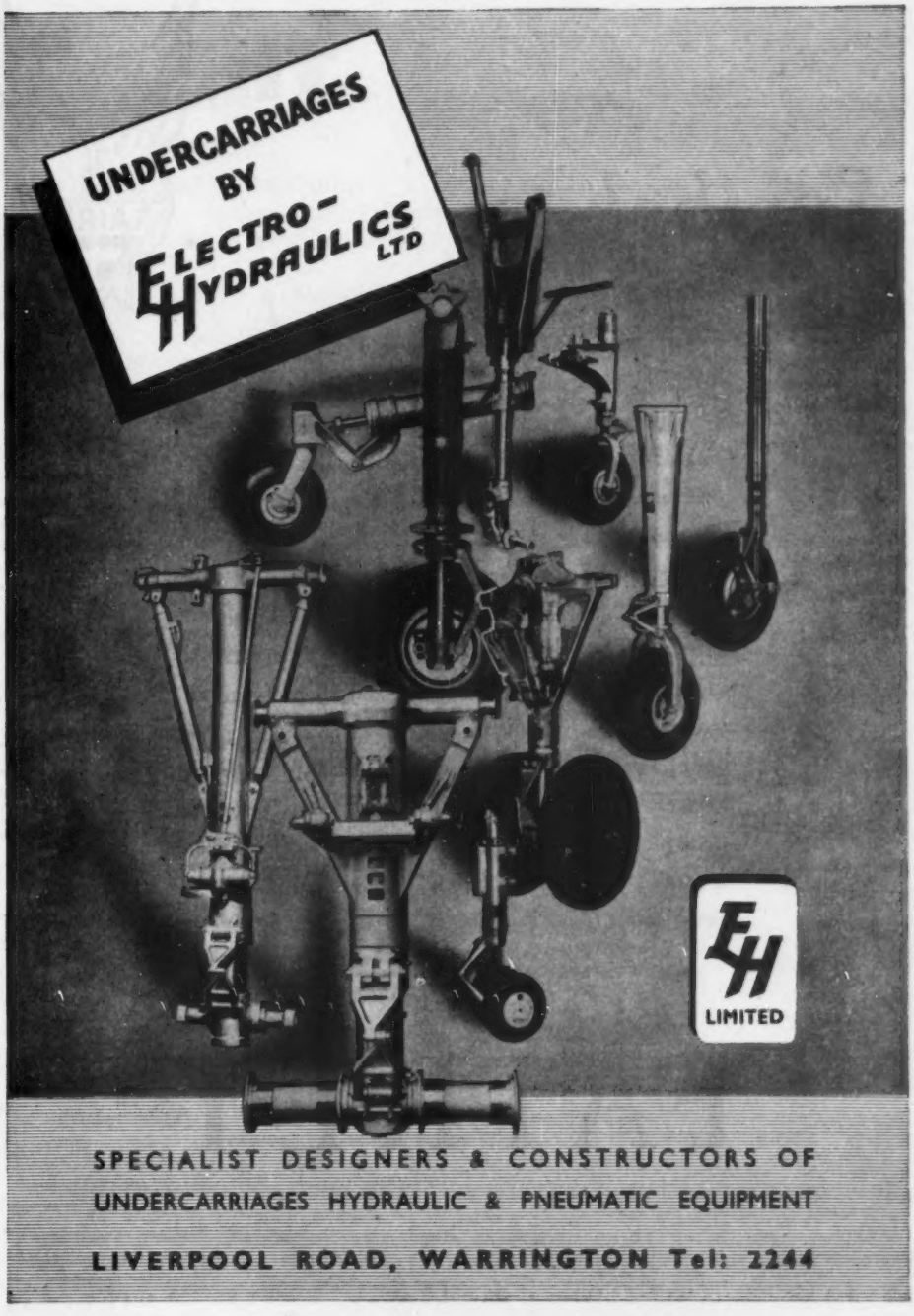
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IN THIS ISSUE:

Refuelling the Comet - 114
N.A.T.O. and the Air - 120
Placed on Record - - - 121
Para-rescue Course - - 125
In Production at Hatfield 126
A Drop in Wages - - 128
Italian Private Enterprise 129

Fair Shares for Test Pilots

ALTHOUGH the job of the experimental test pilot is occasionally over-dramatized in films and in print, the skill, technical knowledge, experience, physical endurance and danger which it entails are generally appreciated, and no one will have read of the recent award in connection with salaries for Ministry of Supply Test pilots without thinking or remarking "Good luck to them; it was about time!" For all crew categories the increase more than doubles their pay, and for most multiplies it by three.

This is in part an indication of the extent to which they were underpaid previously, but it also reflects a realization which has spread slowly through aviation and finally penetrated to benefit these civil flying servants—namely, that employers have a responsibility beyond mere payment to men whose career, for one reason or another, is bound to be a short one. M.o.S. pilots have no superannuation scheme, and no life or accident insurance is taken out for them. Thus, in making comparisons with airline pilots' salaries or with the pay of test pilots in the aircraft industry, allowance must be made for the £500 p.a.—a representative figure—paid by the employer as a superannuation subscription in the case of the former and nearly as much paid in insurance premiums in the latter instance. In making these observations, we do not imply that test pilots consider themselves worthy of "danger money"; but they do—and rightly—think of their dependents.

Airline pilots' pay now ranges between minima of £815 for a second officer to £2,150 for a senior captain (1st class). The new M.o.S. rates are £2,400 to £3,200 for pilots, without, as we have said, superannuations or insurance, and for a possibly more hazardous job with no prospects of continuation after a very early retirement (always assuming, as a cynic has remarked, the occasion should arise).

So far as the industry is concerned, rates of pay are on average comparable with those of the airlines, but most companies have recently made more generous insurance provision, in several cases doubling the cover of a year or two ago. Age and responsibilities may be said to account for the fact that comparatively few test pilots achieve the equivalent of senior captain's pay. Experimental test-flying is strictly a young man's work, although there are one or two fit enough, having grown up and survived in the job, to continue until quite a ripe old age—in the middle forties.

The only criticism which might be levelled at the new salary scale for M.o.S. test pilots is the manner of giving the additional money. The size of the net increase with income tax deducted may come as a shock and may be found to represent only a little more than will be required to effect adequate private insurance. It might have been preferable to arrange a rather smaller salary increase and provide generous insurance in addition. This would also have avoided giving the general public, at this time, any misleading impression about the size of test pilots' salaries.

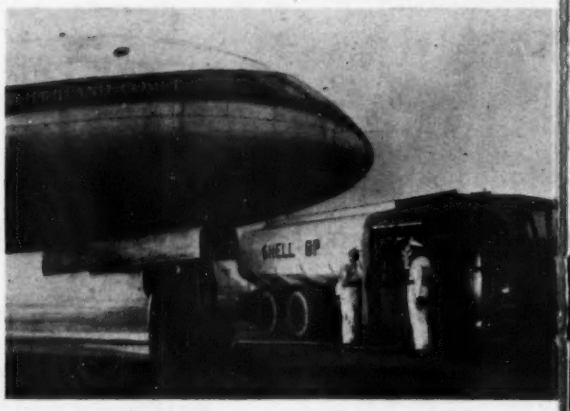
The Services' Case

News of the revised scale brings us to one more very important consideration, namely the relative position of R.A.F. and Navy pilots testing literally side-by-side with their M.o.S. and industry brothers. There are some fifty of them at Boscombe Down and Farnborough. They have their pay and allowances which, for the ranks usually concerned, would be between £900 and £1,500 p.a., and they have a pension fund and continuation of employment (if permanently commissioned) after their term of testing. But this sort of flying is in peace-time a great deal more hazardous than any other, and many find that their private insurance policies are invalidated if they indulge in testing. No price, moreover, can be put on the wear and tear on test pilots' and their families' nerves.

We believe that there is a strong case to be made for special insurance provision to be made during their tour of duty for those in the Services who are called on (or as is usually the case, who volunteer) to be test pilots. This applied before the Civil Service Arbitration Tribunal's latest award, and might well have been tied in with an overall insurance scheme for all who test for the Fighting Services and the Ministry.

REFUELLING THE COMET

Transferring 21 Tons of Kerosine in 20 Minutes by the Under-wing Pressure System



The new Dorset refueller has been put through comprehensive trials with the Comet preparatory to operational service.

AS the mean block-speed of an airline's equipment is increased, so does the time that each airliner spends on the ground assume progressively greater importance. The de Havilland Comet, which promises to earn revenue more rapidly than any other transport in production, has shown beyond doubt that the speed with which it can be serviced must influence, to a great extent, the ultimate economy of its operation. This lesson has been demonstrated frequently during the comprehensive proving trials conducted by B.O.A.C.

On a scheduled service, the period that must be spent at a staging point is often governed by the time required to complete refuelling; this will usually be the longest continuous servicing item, other tasks being of a more incidental nature. It thus becomes of primary importance to provide a tanker capable of a very high delivery rate and further, to enable the aircraft to take on fuel at that rate.

Shell are now in the process of stationing at the appropriate airfields the new 3,000-gall Dorset refueller, built by Thompson Bros. (Bilston) Ltd., which was designed specifically to meet the exacting demands of Comet services.

It may not be generally realized just how much kerosine the Comet can take on board. The later series 1 aircraft have a capacity of 7,000 gal (31,850 litres). The first Comets—the early Series 1—had a total tankage of 6,030 gal, and it is to this type that the following description refers. All fuel is carried in the wing, there being bag tanks in the centre-section—a 2,020-gal tank under the cabin floor and 785-gal tanks just outboard of the power plants—and integral outer-wing tanks, each with a capacity of 1,220 gal. The system is designed not only for pressure refuelling from the underside of the wing, but also for conventional replenishment from the wing upper surface. Waymouth capacity-type contents gauges are employed, together with withdrawable "drip-sticks" in the tank under-surfaces for visual checking on the ground. A drip-stick is shown in use in one of the accompanying photographs.

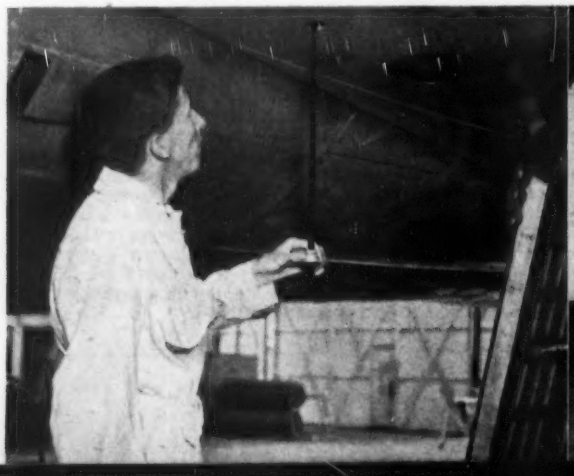
Initial fuel-feed to the power units is by S.P.E. immersion booster-pumps, two of which are fitted in each tank; provision is also made for suction feed as a stand-by. Each pump may be removed from the underside of the wing without draining the tank concerned.

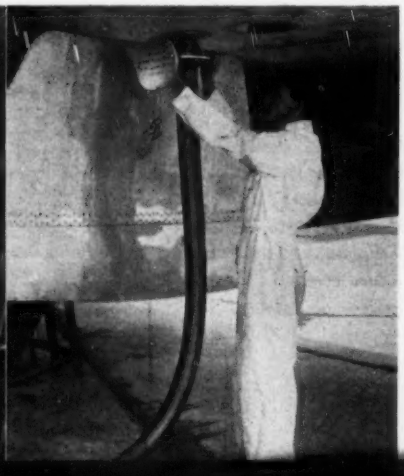
Venting air is drawn from an intake in the wing leading-edge; should jettisoning become necessary, the ram pressure from this intake is employed to blow out the fuel from the three centre-section tanks. Access to all tanks is *via* inspection covers in the under surface of the wing.

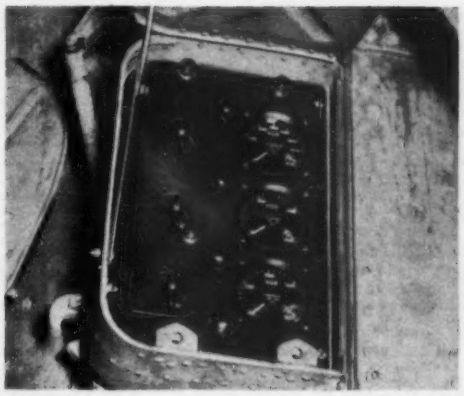
The under-wing pressure-fuelling system employs only two under-wing refuelling points. The connection under the port wing is piped to the large central tank and the inner and outer wing tanks on the port side, while the starboard fuelling-point supplies only the inner and outer wing tanks on the starboard side. Each of these external connections consists of a standard Lockheed Avery screw-coupling, situated at about 50 per cent chord just outboard of the main-bogie well on each side. During refuelling, each coupling is only some six feet from the ground—a most convenient working height. From these points the fuel is led to the appropriate tanks through large-diameter pipes in which are situated electrically operated refuelling valves. As each tank becomes full, a float-operated cut-off switch automatically closes the appropriate refuelling valve and shuts off the supply to that tank. As a safeguard against excessive pressure caused by overfilling all tanks are provided with blow-off relief valves.

In each of the main undercarriage wells is situated a refuelling control panel (see illustration) which includes a three-position switch for each tank, reading "refuel," "off," and "off-load." These switches are normally restricted to the two former positions by a hinged flap, which must be raised before they can be moved to the "off-load" position. Each panel also has a dial contents gauge and red warning light for each of the tanks it serves.

The amount by which the tubular drip-stick (left, below) has to be withdrawn from the tank before fuel can escape down it is a direct measure of the fuel contained in the tank. The action of screwing home the Lockheed Avery coupling—as shown in the right-hand photograph—automatically opens self-seating valves in both the tank and the hose union. It will be noted that the operation can easily be performed from ground level.







The refuelling control panel in the port wheel-well; this panel controls the supply to the two port wing tanks and the large belly-tank.

A refuelling master-switch is fitted in the belly of the aircraft, accessible through a door, which, when opened, moves the switch to the "off" position. Putting the master-switch "on" energizes the electrical circuits and illuminates both the refuelling control panels.

The sequence of operations is as follows. Attention is first paid to the blow-off valves: their covers are removed, the safety-catches released and each valve is tested by momentarily opening it by hand. The control panels in the undercarriage wells are then opened and the master-switch in the belly of the aircraft is turned "on." The bonding connections are then made between the Comet and the tanker vehicle, the Comet and earth, and the tanker and earth.

The aircraft is then ready to receive the refuelling hoses. When the hose union is screwed fully home into the under-wing refuelling point, self-sealing valves in both the aircraft and the hose are opened automatically. If two hoses are used, one to each refuelling-point, both the control panels must be manned; the control switches on these panels are then moved to "refuel" for the tank, or group of tanks, required, and delivery from the tanker begins.

The refuelling switches are held open magnetically until the fuel in each tank is some hundred gallons short of capacity, at which point the level of fuel is sufficient to operate the cut-out switch, thus stopping the flow to the "full" tank and causing the appropriate red warning lamp to light. If the tanks are to be topped up, the tanker delivery is reduced to about 50 gal/min, and the control valve for each tank held in the "refuel" position until the red warning light again shows that the tank is full. At any stage, the flow to any tank can be stopped by over-riding the magnet on the control switch.

Considerable hydraulic shock can arise from suddenly arresting heavy fuel flows, and provision is made for absorbing peak pressures of up to 50 lb/sq in, although the static pressure must not exceed 30 lb/sq in. Tank contents can be read off in kilogrammes from the control panels and may be checked by referring to the appropriate drip-stick.

Off-loading of fuel is achieved by lifting the hinged cover over the control switches on the refuelling panel, and, with the master switch "on" and the tanker set to draw fuel from the aircraft, holding the control switch in the "off-load" position until the required amount has been withdrawn.

Finally, upon unscrewing of the fuelling-hose union from the aircraft socket, the automatic valves are closed in both the aircraft and the hose, fuel loss being almost completely eliminated. There remains only the necessity of removing the earthing and bonding connections, and closing the fairing covers over the refuelling points and control panels.

The method of refuelling adopted may sound, on paper, more complicated than that used in more conventional aircraft. In practice, it has been found to work very well, and a properly trained crew can put huge fuel-loads into a Comet in very short periods. This is partly due to the use of the new refuelling vehicle, which can deliver 200 gal/min through each hose, and partly to the automatic shut-off valves within the aircraft.

FROM ALL QUARTERS

W. RIDLEY PRENTICE

YET another of the holders of the first hundred R.Ae.C. Aviators' Certificates, Waldo Ridley Prentice, is no longer with us. He was first a member of the Club in 1911 and, though he resigned soon after the 1914-18 war in order to take a diplomatic post in Lisbon, he rejoined in 1940. In May 1951 he had a bad heart attack, but recovered after three weeks in hospital and was frequently to be seen at the Club later in the year.

Ridley Prentice is remembered as one of the small select band of pioneer airmen at Hendon in 1911 and 1912. He learned to fly at the Grahame-White School on a Farman biplane and "took his ticket," No. 67, on April 25th, 1911. He then joined Horatio Barber's Aeronautical Syndicate, Ltd., and flew a great deal on their curious tail-first Valkyrie monoplanes.

When Barber closed the Syndicate in 1912, Prentice joined General Aircraft Contractors, Ltd., a firm which held concessions in Britain from Anzani Engines, Emaillite, and other firms.

He never flew very much after the A.S.L. closed down, in 1912, because of early heart trouble, and for that reason he did not join the R.F.C. or R.N.A.S. in the first war. Instead, he went into the diplomatic service, in which he served for thirty years, most of it in Lisbon. It was his intention to settle down finally in Madeira, where he had lived for some time, and when I last saw him in the Club, in November, he told me with boyish zest that he was off to the island the next day.

When he got there, however, he found the hills too much for his heart, so he returned to Lisbon and was staying at the British Club there when he died of heart failure on January 18th, at the age of 68. He leaves a widow. G.D.

CO-OPERATIVE WIND TUNNEL

THE Society of British Aircraft Constructors announced last week that 11 firms in the industry have co-operated in the formation of a company to be known as the Aircraft Research Association, Ltd. Its purpose is to design, build and operate what will be the largest transonic-supersonic wind tunnel in this country. The tunnel will require approximately 35,000 h.p. for its operation.

Negotiations are already in hand with the Ministry of Supply and other authorities on the siting of the tunnel and the supply of power and other services.

The project was initiated by the Technical Board of the S.B.A.C., which reported that British progress in aircraft design and development now demanded provision of a large wind tunnel

MAKING HISTORY AT HATFIELD: As we recorded last week, a full C. of A. for the de Havilland Comet was formally handed over at Hatfield on January 22nd by the Minister of Civil Aviation, Mr. J. S. Maclay. As seen here, the Minister first received the certificate from Mr. R. E. Hardingham, chief executive, A.R.B. Others present, l. to r., were:— Sir Arnold Overton, Permanent Secretary to the Ministry of Civil Aviation; Air Chief Marshal Sir Frederick Bowhill, Chief Aeronautical Adviser to the Ministry. Mr. W. E. Nixon, managing director of the de Havilland Company; Mr. F. E. N. St. Barbe, deputy managing director; Mr. F. T. Hearle, chairman; and Mr. R. E. Bishop, C.B.E., F.R.Ae.S., a director and the designer of the Comet.

FROM ALL QUARTERS . . .

capable of operating at speeds just below and higher than the speed of sound, and available at all times for use by the industry.

The firms concerned are: Blackburn, Boulton Paul, Bristol, Fairey, Folland Aircraft, Handley Page, Hawker Siddeley Group, Rolls-Royce, Saunders-Roe, Vickers-Armstrongs and Westland Aircraft.

The registered offices of the new company are at the S.B.A.C.'s headquarters at 32, Savile Row, London, W.1. (Regent 5215.)

Vampire Night Fighter Performance

IT is now permissible to disclose performance figures for the D.H.113 Vampire Night Fighter (R.A.F. designation N.F.10). The power unit is a Goblin 3 and full A.I. radar and other navigational aids are specified. The makers claim that, as the four 20 mm guns are fuselage-mounted, greater accuracy of aim is afforded than with a wing installation; it is also possible to continue firing with one gun inoperative without detriment to stability.

The operational ceiling is 40,000ft and is reached in 16.3 min. With 100-gal drop tanks the corresponding figure is 34,000ft, reached in 17.5 min. Maximum level speed is 467 kt (537 m.p.h.) at sea level, and 452 kt (519 m.p.h.) at 45,000ft. At a Mach number of 0.7 at 40,000ft the radius of steady turn is 1.95 nautical miles and at the same speed and height a minimum radius of turn of 0.5 nautical miles is possible. At lower altitudes these figures are, of course, considerably improved.

With allowance for take-off, climb, 10 min combat and descent, the patrol duration, with drop tanks, is 2.7 hr at 30,000ft, or 1.45 hr without them; at 40,000ft the figure is 1.2 hr without drop tanks. Without external equipment the limiting Mach number at 40,000ft is 0.815; with drop tanks, 0.755.

The Maharajah of Jodhpur

IT is with regret that *Flight* learns of the death, in a flying accident, of the 28-year-old Maharajah of Jodhpur, one of India's most air-minded princes. The Maharajah—who was flying as a passenger at the time—was a keen and experienced pilot who had done a great deal to further the cause of aviation in India. Much of his enthusiasm was undoubtedly inherited from his famous father, A. V/M. Maharajah Sir Umad Singhji, G.C.S.I., G.C.I.E., K.C.V.O., who was the first Indian prince to become a well-known pilot and who was primarily responsible for ordering the construction of the fine modern airport at Jodhpur.

Trouble Area

AMONG the anti-British manifestations in Egypt last week was the holding of four B.O.A.C. aircraft at Farouk Airport, Cairo (Sir Miles Thomas was among 120 passengers detained for eight hours), and the Corporation wisely decided to re-route all aircraft which normally call at the airport. Beirut, therefore, is being used as a diversionary refuelling point for all B.O.A.C. aircraft flying on services to and from Pakistan, India, Ceylon, Australia, Hong Kong and Tokyo. The Hermes services to Nairobi are being re-routed *via* Tripoli. A Comet which left London last Saturday on a route familiarization flight to Johannesburg in preparation for the opening of regular services in May also called at Beirut instead of Cairo. Operators of other nationalities made no diversions, but T.W.A. discontinued night arrivals at Farouk.

Meanwhile, B.O.A.C. was planning last week-end to send two Yorks to Cyprus, with spare crews, in order to assist in the evacuation of the wives and families of the Corporation's employees in Egypt should the situation demand it. A number of women employees had already been moved from Cairo.

Test Pilots' Pay

THE Civil Service Arbitration Tribunal has awarded Ministry of Supply test pilots a new scale of salaries. The official statement says that, after consideration of statements and submissions, and of the fact that no superannuation provision is made for M.o.S. test pilots, a new salary-scale is awarded, to be retrospective from October 1st, 1950. The new rates are:—

Chief test pilot	£3,200
Test pilots	£2,400-£2,900
Navigators, flight engineers and radio officers ...	£1,300-£1,550

The award affects 13 M.o.S. aircrew, namely, the chief test pilot of the civil aircraft test section at Boscombe Down, Mr. (G/C. Ret.) "Bruin" Purvis, and with him "Doc" Stuart and R. J. Taylor, and three other pilots in the armament, structural and mechanical engineering, instrument, and radio flights at Farnborough. In addition to these pilots there are three flight engineers, two radio officers and one navigator.

It has been felt for some time past that test pilots' pay and provisions in the form of superannuation and insurance have been inadequate. The new scale is discussed in our leading article in this issue.

R.A.F.A. Ball in Switzerland

ST. MORITZ, the winter-sports centre, will be the setting for the "Wings Ball," to be held at the Palace Hotel on Saturday, February 9th. The Ball is being held under the patronage of the British Minister to Switzerland, Mr. Patrick Scrivener, K.C.M.G., and is being organized by the Royal Air Forces Association's Continental Committee, whose address is 12, Rond-Point des Champs Elysées, Paris 8.

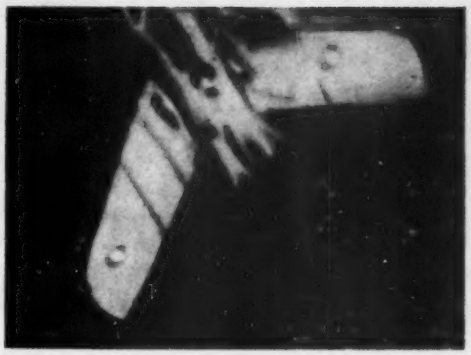
First R.N.Z.A.F. Hastings Delivered

LAST Wednesday, January 30th, the Rt. Hon. S. G. Holland, C.H., prime minister of New Zealand, was due to officiate at the handing-over ceremony of the first Handley Page Hastings C.3, one of four ordered for the Royal New Zealand Air Force. The aircraft will be fully furnished as a trooper, and is expected to take off on its delivery flight over the normal Transport Command route on or about February 12th. The crew of five, of No. 24 Commonwealth Squadron, will be captained by F/L. C. L. Seigert, D.F.C., R.N.Z.A.F., and some 25 recruits will be carried, including W.R.N.Z.A.F. personnel. The second and third aircraft are expected to follow at approximately 14-day intervals; one will carry freight and the other more recruits. The fourth machine will not be complete until later in the year.

Reference has already been made to the differences between the Hastings C.2 and C.3, chief among which is the fitting of Hercules 737s in place of the 106s of the Mk 2s. The 737s have single-stage blowers which give them better take-off and climb performance and higher speed (about 18 m.p.h. up to 6,250ft) at low levels. Their weak-mixture ceiling is 18,600ft. The two-stage Hercules 106s in the C. Mk 2, however, give it a w.m. cruising ceiling of 26,700ft. The I.C.A.N. take-off figure for the C.3 at sea level and 80,000 lb a.u.w. is 1,335 yd to clear 50ft.

The R.N.Z.A.F. were not impressed with the radio equipment of the Hastings as specified by the R.A.F., and it is understood that the new Marconi equipment to N.Z. specification as fitted in the C.3s is considered to be a great improvement. The radio operator's and navigator's stations have been slightly modified to accommodate the new installation.

INTERNATIONAL VISIT: A party from the N.A.T.O. Standardization Committee recently visited the Gloster airfield at Moreton Valence and saw the G.A.5. Left to right in this group are:— Col. G. Grimal; Mr. F. W. Johnson, M.o.S.; Mr. F. Sanders, project-designer; Mr. R. W. Walker, chief designer; Mr. W. Yardley, R.T.O.; Ing.-en-Chef R. J. F. Pommeret; A. Cdre. G. Hayes; G/C. Stovell, R.C.A.F.; Col. H. G. Montgomery, U.S.A.F.; Ing.-en-Chef J. G. A. Etorse; Lt. Col. Montravel; Mr. Eric S. Greenwood, technical sales manager; W/C. J. W. Monk; Cmdt. Carpentier; Mr. G. Kay, design office.



THE CAPTURED MIG: For this first picture of the Mig-15 salvaged as the result of a joint effort by British, American and South Korean forces (See "Flight," September 7th, 1951), we are indebted to the American publication "Naval Aviation News." From North Korea the Mig was shipped back to Wright-Patterson Air Force Base. It is stated that what appear to be insignia are coils of rope used by the salvage party. The tail unit was 350 yards distant.

King's Cup Race at Newcastle

ON Monday last the Royal Aero Club announced that the 1952 King's Cup Air Race is to be flown on Saturday, July 12th, from Newcastle-upon-Tyne municipal airport.

Four international races will also be flown at this meeting, for the Kemsley, Norton Griffiths, Grosvenor and Air League challenge cups and trophies.

New Zealand Race Conditions

ENTRY forms, conditions of entry, and details of handicap formula have now been issued for the England to Christchurch Air Race, which is to take place in October, 1953. The tentative date of the start is October 10th.

The race will be run under the regulations of the F.A.I. and the competition rules of the Royal Aero Club, who are the authorized representatives in this country of the Canterbury International Air Race Council, Inc., of Christchurch, New Zealand. There will be two sections in the race, one under the heading of "Speed," and the other of "Transport Handicap." Both will be run concurrently and are open to landplanes or flying-boats. The very handsome prizes for the Speed Sections are: first prize, £10,000 and the Harewood Gold Cup; second, £3,000; third, £1,000; fourth, £500. For the Transport Handicap the monetary prizes are the same but no cup is offered. The entry fee is 100 guineas in each section.

The route could not be simpler. It is announced as England-Christchurch, with an intermediate control-point to be established in the general region of Basra, the exact location to be announced later. The starting-point will be in Great Britain, but the actual point or points cannot be decided until it is known how many aircraft are entered, and of what type.

Refuelling in flight is to be permitted in the Speed Section, but not in the Transport Handicap, and the entry fees are 100 guineas.

In the Transport Section a full crew must be carried in accordance with the aircraft C. of A. and an allowance will be made for additional passengers or relief crew, any of whom, with the exception of the pilot in charge, may be off-loaded during the race provided their weight is replaced by ballast. Fuel reserves, instruments, and equipment necessary for the safe conduct of the flight must be carried, together with dinghies, marine distress-signals, visual and radio signal devices, and sufficient food and water for seven days. Military aircraft must carry a form of airworthiness certificate issued by the Government authority concerned.

Officials will affix seals to each aircraft 24 hours before the start of the race, and these must remain unbroken during the whole contest. Engines may not be replaced during the race, but minor replacements will be allowed on airframes or power units.

In Section 3 of the regulations, dealing with handicap formula, there are several points of general interest. For example, the total weight of passengers plus luggage must not be less than 40 per cent of the total payload, and the total weight of passengers, luggage and freight must not be less than 60 per cent of the total payload. The total volume of passenger accommodation must be such as to provide not less than 55 cu ft per passenger carried.

Fuel carried in sealed tanks throughout the race may rank as freight and can be included in payload, provided the overall freight density does not exceed 15 lb/cu ft. The declared all-up weight need not necessarily be the all-up weight permitted by the C. of A. for the aircraft, but if the declared weight is lower than the maximum permissible the competitor must provide means by which it can be checked that the declared weight is not exceeded throughout the race.

The handicap formula is $V = C\frac{W}{P}$, where:

V = Handicap Speed, i.e., block speed in m.p.h. on which starting time is based.
C = 55 for airscrew-driven aircraft or 60 for jet aircraft.
W = Maximum all-up weight (lb) for any stage of the race.
P = Total payload (lb), including passengers, luggage, freight and furnishings.

In the event of an entry being provided with both airscrew and jet propulsion the authorized representative will have the right to assign an intermediate value to the constant C.

Entry forms must be in the hands of the organizers or their representatives not later than January 31st, 1953, but certain details need not be filled in, in the first forms, provided that such additional information is supplied not later than June 20th, 1953. Any variation of particulars which occurs after this date must be notified in writing not later than September 25, 1953, and acceptance will be at the discretion of the Royal Aero Club of the United Kingdom. Entry forms must be submitted in duplicate.

The race is open to any individual, organization or nation. One requirement is, that the course must be completed within 168 hours (seven days) of the authorized starting time of the last aircraft.

Recently Mr. H. D. Christie and Mr. John Stannage, representatives of the C.I.A.R.C., were present at a meeting of the Records, Racing and Competitions Committee of the Royal Aero Club. Maj. R. H. Mayo was in the chair. At the time the two visitors had just completed a six-weeks tour of America, where they had found that great interest was being shown in the race. They stated that it was probable that both U.S. Air Force and U.S. Navy aircraft would participate. In addition to the American Services several individuals, including Miss Jacqueline Cochran (turboprop Convair), Mr. Paul Mantz (Mustang), Mr. George Swinner of the Chicago Adventurers Club (Constellation), and Mrs. Diana Bickley, are understood to be interested.

Netherlands Tactical Air Force

THE Netherlands Tactical Air Force, which came into official existence as on January 22nd, will constitute the first important step in the development of Holland's air defence, as part of the country's obligations under the N.A.T.O.

These obligations, says a Dutch Air Force statement, are defined under two headings: the building up of territorial defences against enemy air bombardment of towns, harbours, industrial installations, etc., and the development of a fighting force to support the ground defences. Territorial air defence has been in existence for a number of years, under the responsibility of the Air Defence Command, which is now equipped with Gloster Meteors.

The actual beginning of the Tactical Air Force dates from the time when, last year, the first Thunderjets came from the U.S.A. under the Mutual Military Air Programme. Now the organization of the Tactical Air Force has been given final form. In addition to the already existing Air Defence Command, and the Air Training, Airborne Troops, and Air Force Material Commands, there will now be a Tactical Air Force Command, quartered at Eindhoven under Col. J. L. Zagers.

Valiant Test-Flight Inquest

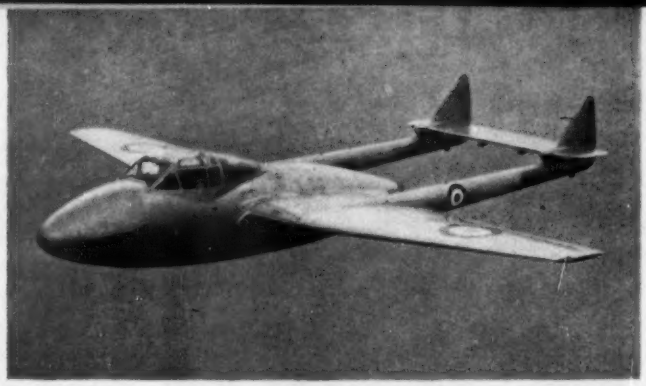
IT will be recalled that when the Vickers Valiant was lost on January 12th after a fire in the air during a test flight, all five members of the crew landed safely by parachute with the exception of an R.A.F. officer, S/L. Hugh Douglas Foster, who had been flying as second pilot. There was evidence that, though his parachute opened, he was injured before reaching the ground.

At the inquest on S/L. Foster, held at Bournemouth on January 23rd, Mr. G. R. Bryce, the pilot, explained how he and Foster left the aircraft by operating their ejector seats (an earlier witness had stated that there were two separate exits, one for the pilots and one for the crew-members, to be used in an emergency).

Bryce, who had been last to leave the aircraft, said that from his subsequent examination of Foster's ejector seat there was no indication that it had struck any part of the aircraft, but that discussion of the circumstances with doctors of the Institute of Aviation Medicine had led him to believe that the seat might have struck the fin of the aircraft. In answer to a question by the foreman of the jury, Bryce said that the parachute would not normally open automatically, but could have been accidentally released by striking the fin.

The jury returned a verdict of death by misadventure.

HERE AND THERE



VAMPIRE T.11 is the M. of S. designation of the de Havilland Vampire Trainer. The example depicted is one of two production machines which are to be delivered to the Royal Navy for evaluation trials. The Vampire Trainer has been ordered in quantity not only by the R.A.F. but by the R.A.A.F. and other air forces. Eventually, ejection seats will be fitted.

Saab Delta Flies

ALTHOUGH reports that the Saab delta had flown were current at the time of its taxying trials, the maiden flight was not, in fact, made until Monday, January 21st. On that day, Saab's chief test pilot, Eng. B. R. Olow, took the machine up for a successful flight of about 25 minutes. Minor control troubles which had been experienced during the runway hops have been rectified.

Radio's Aid

REARMAMENT orders to the radio industry—among which, of course, aircraft equipment figures very largely—have risen sharply during the past few months. According to *The Financial Times*, unfulfilled contracts at the end of 1951 stood at over £76m, as against just under £43m nine months earlier.

Progressive Strength

THE U.S. Air Secretary, Mr. Thomas K. Finletter, recently expressed the opinion that, although the U.S.A.F. was mainly equipped with second-line aircraft, it was sufficiently large to discourage aggression. The present 90-wing force represented a "100 per cent build-up" over the pre-Korean Air Force but, declared Mr. Finletter, only the authorized 143 wings could enable America to prevent war.

D.S.I.R. Appointment

THIS month, Sir Andrew McCance, D.Sc., LL.D., M.I.Mech.E., F.R.S., is to assume the office of chairman of the mechanical engineering research board of the Department of Scientific and Industrial Research in succession to Sir Henry Guy, C.B.E., D.Sc., M.I.Mech.E., F.R.S.

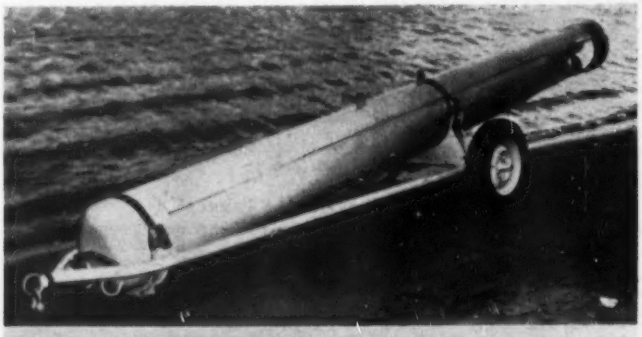
Battle of Britain Week

THIS year, Battle of Britain Week is to be observed from September 15th to 21st. Battle of Britain Day, always observed on September 15th, will fall on the Monday, and R.A.F. At Home Day, when stations are open to the public, will be on the following Saturday, the 20th.

Cheapest Aluminium in Europe

IN its annual survey of the aluminium industry the Norwegian Aluminium Company states that the world's total production of raw aluminium in 1951, excluding the Soviet Union, was between 1,300,000 and 1,400,000 tons. Norway's production was about 50,000 tons, produced by the Ardal Verk, Norsk Nitridaktieselskap, and Norwegian Aluminium Company. Norway's aluminium production will be increased by another 40,000 tons a year when the new Sunndalsora plant comes into operation in 1954. Prices quoted by the Norwegian Aluminium Company show that Norway, of all important European producer countries, has the cheapest aluminium at £117 5s. a ton.

FIRST DELTA PASSENGER is Gloster test pilot Brian Smith, who was lately airborne with his chief, "Bill" Waterton, in the massive twin-Sapphire G.A.5 multi-purpose fighter.



REVERSE OF LETHAL: Douglas Aircraft have developed this "torpedo" for dropping from aircraft; it contains an automatically inflated eight-man life-raft; four-cylinder engine, fuel for 300 miles, radio, heating equipment, survival kit, and food for eight days. Technical details are lacking, but a reference to "radio control" suggests that in its torpedo form it can be made to travel in the direction of a ditched crew. The container is constructed mainly of light alloy.

R.A.E. at the B.I.F.

INDICATING the value of plastics as a substitute for metals diverted to the rearmament effort, the plastics section at this year's British Industries Fair (May 5th-16th, will be half as large again as at last year's show. A central feature staged by the Ministry of Supply in conjunction with the Royal Aircraft Establishment will emphasize the possibilities of moulded plastic construction for large components as opposed to detail fittings and small articles generally; it is probable that the R.A.E. plastic wing will be featured.

A Cranfield "Annual"

THE Senior Common Room Society of the College of Aeronautics, Cranfield, is to hold its fourth annual dinner on Friday, April 4th.

U.S. Contracts for Italy

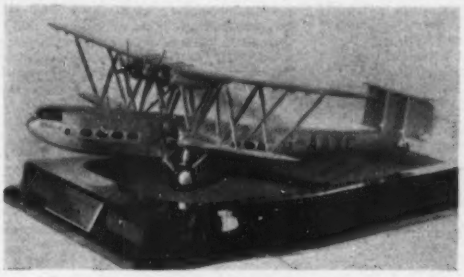
IT is reported from an American source that U.S. contracts worth about $180,000,000 are to be lodged with the Italian aircraft industry during the next two or three years. The principal manufacturers concerned are said to be Fiat and Macchi.

W.J.A.C. Post

AN ex-A.T.A. ferry pilot, Miss Freydis Leaf, has been appointed Aviation Officer to the Women's Junior Air Corps. She has held the post of Corps Pilot for the past three years, and during the war, in the course of her A.T.A. duties, she flew some 1,500 hours on a great variety of operational types. She is being assisted in her new post by Mrs. Diana Barnato Walker, who was also a war-time ferry pilot.

RUSSIAN DIVE-BOMBER: This drawing—the authenticity of which cannot be guaranteed—purports to show a Russian naval dive-bomber which was seen in numbers in the Vladivostock area during 1949. Navy-blue upper surfaces and grey lower surfaces were reported. Some machines of this type are also said to have been used as target tugs.

IN RECOGNITION: This superb scale model of the H.P. "Heracles" was presented to the Aircraft Recognition Society by Sir Frederick Handley Page, to be offered as a challenge trophy at the annual recognition contest. Forming the prize for the best performance by an A.T.C. team, it was won on January 19th by cadets of No. 4F (Ilford) Squadron.



Nice Work

A U.S.A.F. B-36 was successfully force-landed near High Post, Salisbury, in the early hours of last Sunday morning. A strong security guard was later posted round the aircraft.

Atlantic Flight Memorial

THE Royal Institute of Architects of Ireland is holding a competition for the design of a memorial to the late Sir John Alcock and Sir Arthur Whitten Brown. The memorial will probably be built on the wild moorland near Clifden, Co. Galway, where their 1919 transatlantic flight terminated.

First German Post-war Display

THE first international air display to be held in Germany since the war is to take place in late May or early June, at the Munich-Riem airport; an ambitious programme is being planned. Intending participants are invited to write to the promoters—the aviation journal *Aero*—at Hermann-Lingg-Strasse 9, Munich 15. In issuing the invitation, the organizers add that "the runway is long enough for such aircraft as the Brabazon and Comet."

Another D.H. School

AMONG steps taken by the de Havilland Aircraft Co., Ltd., to alleviate the shortage of skilled workers is the establishment of a training school, where aircraft fitting and assembly will be taught. Hatfield Public Hall, the Hertfordshire towns' meeting-place for 42 years, has been leased to the company for this purpose, and courses for 50 trainees at a time will be held, lasting between six and nine months.

Invisible Tentacles

THE very real danger of passing in front of the intake of a running gas turbine was underlined at a Montreal inquest recently, held following the death of a Canadair employee who was sucked into the nose intake of a Sabre. Witnesses said that the man was drawn towards the intake from 25ft away. A somewhat similar accident was the subject of an inquest in this country last week, on an R.A.F. junior technician at Boscombe Down; in this case, also, a Sabre (which has an unguarded intake) was involved.

MINISTERIAL APPROVAL: "I am gratified to learn that Short Brothers and Harland are employing well over a thousand more workers than was the case a year ago," said Sir Walter Monckton, Minister of Labour and National Service, after a visit to the Belfast works on January 16th. Sir Walter is seen here with (left) Rear-Admiral Slattery, managing director, and (right) Maj. I. Neill, Northern Ireland's Minister of Labour.

SERVICE INTEREST: A party of R.C.A.F. and R.A.F. senior officers, among whom were A.V-M. A. C. H. Sharp (Air Ministry) and A.V-M. Douglas Smith. R.C.A.F., paid a two-day visit to the Bristol Aeroplane Company's works last week. In the picture below, G/C. Johns, R.C.A.F., and Air Marshal Sharp are seen examining a Proteus turboprop in company with Mr. George Wright (general manager, engine division).

N.A.T.O. and the AIR

Sir A. H. Roy Fedden

Mr. G. A. Huggins

THE North Atlantic Treaty Organization is known to most people as N.A.T.O.—"just another set of initials designating some international body." Such organizations are for the most part remote and impersonal and, because they do not impinge directly on the personal life of the individual, are apt to be accorded little thought. But let us face it—so far as the aviation industry of this country is concerned, N.A.T.O. is a power. N.A.T.O. exists to weld together the resources of the 12 member-nations for their collective defence in the hope and conviction that, in this way, aggression may be thwarted and peace preserved. In that the aviation industries of this country, America, Canada, France, Italy and Holland have so vital a part to play if the aim is ever to be made a reality, it becomes obvious that N.A.T.O. *must* have some say in those industries.

That element of the organization primarily concerned with aircraft manufacture as such is the Defence Production Board. Based in London, this body, together with the Financial and Economic Board, and the Chiefs of Staff Military Committee, is directly responsible to the North Atlantic Council of Foreign Ministers through the Council of Deputies. The Defence Production Board comprises delegates of the 12 nations, and a permanent staff of experts, each of whom is a specialist in a particular field. The several specialist departments are normally responsible to a co-ordinator, but since the resignation of Mr. W. R. Herod, who held this post, the responsibility has been shouldered by the Chief of Staff of the D.P.B., Lt.-Gen. Sir Ernest Wood. The Chief of the Aircraft Division is Mr. G. A. Huggins, and the Air Advisor to the co-ordinator is Sir A. H. Roy Fedden, M.B.E., D.Sc., F.R.Ae.S. Sir Roy's background in the aviation industry of this country is so well known that we need not repeat it here. Mr. Huggins, however, is not so widely known in Great Britain, and it is thus of point to record that he served for 20 years with Douglas Aircraft, finally becoming general manager of the company's Long Beach plant. He joined N.A.T.O. last year and arrived in London to take up his present appointment last October.

The primary task of the Board's aircraft division is to bring the European aircraft industries up to a level of efficiency commensurate with those of America and Great Britain, though not so much in terms of design as in production methods. The whole thing is, of course, a matter of degree. In sheer numbers the U.S. productive capacity is unmatched and, probably, unmatchable. But, given the benefit of American advice on production, there is no reason why, other things being equal, the production capacity of the European industries—and our own—should not be increased to parity with U.S. standards on a *pro rata* basis.

It is the considered opinion of most of the top men in the U.S. industry that British aircraft design is second to none; but, they ask, what is the use of having magnificent designs if, by the time they can be built in reasonable numbers, they are becoming out of date. We must have the aircraft—in strength, and in time—if the free nations of the world are to survive. It is the task of the aircraft division of the N.A.T.O. Defence Production Board to see that the production capacities of the collective aircraft industries are fitted to this supremely important task.

AIR BROKERS: ANOTHER VIEW

FOLLOWING Henry Morris's discussion of air brokerage, in his "Commercial Aviation Commentary" on January 18th, we have received some informative comments—though too late for inclusion in the Correspondence columns of this issue—from Mr. J. Beeson, of Cunard House, Leadenhall Street, London, E.C.3. Rather than allow his letter to stand over for another week, we reproduce it here in slightly abbreviated form.

"Your contributor's remarks," he writes, "will have been read with considerable misgiving by air brokers. His argument is based on the false premise that brokers have forced operators out of business by deliberately depressing market rates and bleeding the operators of 'handsome' commissions. To admit this is to admit that operators have no commercial judgment, and that brokers are in the business to make a quick profit and then get out.

"In the space of six years, the charter business has developed from taxi-flying to world-wide freight and passenger operations. At the outset, speculating brokers appeared on the scene, and pirate operators flourished for a time. These have fallen by the wayside. Between 1946 and 1948 the business was so new that owners, brokers and charterers had to learn it together. There were no customs of the trade, no proper documents of carriage, no fundamental rate levels, and very little stability. The commercial practices of some of the charter companies were casual in the extreme, and charterers, who were at first anxious to support independent air transport, lost a great deal of faith.

"The first practical move to develop the new business and to put it on a sound footing was made by the brokers. A market was founded on the Baltic Mercantile and Shipping Exchange in London, and this became the world centre for supply and demand of airspace. By having such a centre, where orders and available airspace was pooled, the brokers were well on the way to solving the "return load" problem. By having his appointed broker on this market, an operator has a ready made world-wide sales network, *which is paid only when it produces actual business*. Such coverage is wider than even the subsidized corporations get from their world system of branch offices and representatives, *which have to be paid whether they produce business or not*.

"The statement that brokers have produced little new business, and have only succeeded in inserting themselves between owner and charterer, is just so much nonsense. It is estimated that about 80 per cent of the business performed was originally introduced by the brokers. Well over 50 per cent of the total business is international—i.e., originating from foreign sources, and few of the charter companies have the necessary organization to seek it out, and then to co-ordinate it with loads to fill the empty legs.

"The broker expects a fair return from the owner for his services. 'Handsome' commissions are never paid, and it is extremely rare for a broker to receive 10 per cent—although your correspondent suggests this is the normal commission rate. Brokers very frequently fix flights at rates higher than their principals quote, but they rarely receive a higher commission for doing so. Why should they accept a lower commission if they have to fix at the owner's bottom rate? A good broker knows the market, and an owner should quote him the lowest economical price for any job, leaving him to fix at whatever rate he can get, according to market conditions, price of goods, etc. The operator's lowest figure should always include provision for the broker's commission.

"At one time, owners would quote one rate to a broker and a lower rate to a charterer. Sometimes they worked with several brokers at once, offering different prices to each, and frequently only competing against themselves. They have also attempted to cut out the broker by going direct to a charterer after the first flight had been fixed. Fortunately, this type of business has almost disappeared. It did inestimable harm to the cause of the independent operator.

"The operators who were forced out of business largely brought the situation upon themselves. Brokers have always done their best to uphold a reasonable level of rates. Prices, of course, must fluctuate—it is the fundamental law of supply and demand, but the 'rate-war' mentioned by your contributor (which, incidentally, was at its height two years ago, not some months ago) was brought about by owners competing fiercely with each other and with their own brokers.

"Now, a broker is not an inexperienced fool. His earnings are a certain percentage of the sum he gets for an owner. He is also in the air business on a long-term basis. Is it reasonable to suppose he would 'sell' space at less than he could get? Yet they have often seen operators commit themselves to flights for hundreds of pounds less than they need have done.

"It is quite untrue to say that brokers are realizing that airbroking methods cannot follow the practices of the Baltic Exchange shipping brokers. On the contrary, airbroking becomes more and more closely identified with shipbroking and, as it does so, the air business becomes sounder. The Baltic Exchange has two hundred years of transportation experience behind it—but this does not mean that its methods are two hundred years old. Its air side is the most progressive organization in the world for the furthering of the interests of the independent owner.

"The charter companies have six years' experience behind them. Co-operation between owner and broker is certainly better now than it was a few years ago. If the charter business is to survive, there is need for even greater co-operation. The brokers—as always—are willing to extend their hands, but broker and owner must get down to a clear understanding of each other's problems."

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PLACED ON RECORD

A Review of F.A.I.-approved Flying Achievements During 1951

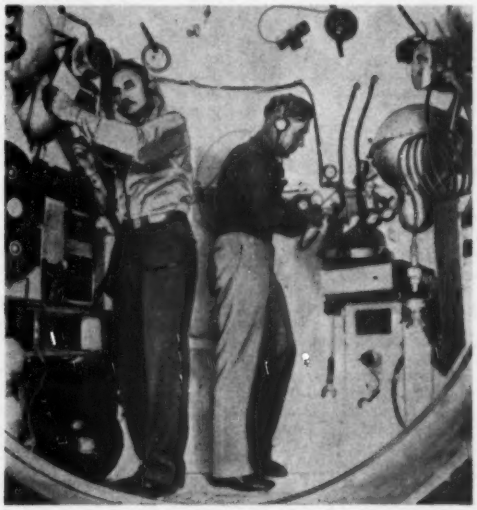
By H. J. COOPER

The Sapphire-Meteor, piloted by R. B. Prickett, at the start of the climb which gained four time-to-height records last August.

EXCEPT for the establishment of the four Rate-of-Climb Records by the Sapphire-Meteor on August 31st, 1951 was not a year of particularly outstanding achievement in the world of aviation records. The rate-of-climb categories were introduced as a result of the F.A.I. Annual Conference at Stockholm in 1950, and the Gloster company's attempts were the first to be made. That substantial figures were attained is a cause for some satisfaction, though it seems unlikely that they will be allowed to stand for very long. R. B. Prickett's climb to 12,000 m (39,370ft) was attained in 3 min 09.5 sec, which is about equal to the rate of climb of the rocket-propelled Messerschmitt Me163, details of which caused a sensation when released at the end of the war.

In general, little advantage has been taken of the various record categories to set up new performances. The attitude of the aircraft industry to record-breaking is one which cannot on the whole be described as keen, while security restrictions do not encourage manufacturers or the Ministries to make an official attempt on the World Speed Record. That record was in fact exceeded—unofficially—when Neville Duke flew the Hawker P.1067 at speeds approaching 700 m.p.h. at Farnborough in September.

In all, 30 records stand to the credit of Great Britain, 21 of which are Point-to-point Records. We hold none of the World Records; three World Class Records for jet-propelled aircraft; four for light aircraft; and one seaplane and one amphibian record. This country has aeroplanes in various categories which could substantially improve on existing records, but not all their owners appreciate the prestige and publicity value of such achievements.



One of the most long-standing records is that for absolute height, made by the balloon Explorer II in 1935. The two U.S. Army Air Corps officers —Capt. Stevens (left) and Capt. Anderson—who manned the balloon are seen here inside the pressurized gondola.

One important record has been lost by this country. John Derry's 100 km Closed-circuit Record of April, 1948, has now been beaten by America. Colonel Fred Ascani, flying a North American F-86E, succeeded in reaching 1,023.038 km/hr (637 m.p.h.) during the U.S. National Air Races at Detroit on August 17th. This record also qualifies as a World Record for Speed over a Closed Circuit, the length of which is not necessarily restricted to 100 km. The Fédération Aéronautique Internationale has agreed to recognize the latter as a World Record, together with that for Distance over a Closed Circuit, which hitherto has been only a World Class Record. This means that the American record of Lt.Col. Lassiter and Capt. W. J. Valentine, of 14,249.656 km (8,850 miles), set up in a Boeing B-29 Superfortress on August 1st-3rd, 1947, now becomes a World Record.

The five World Records are now:—

(1) Distance in a Straight Line without Landing.
(2) Distance in Closed Circuit.
(3) Height.
(4) Speed over a Straight Course.
(5) Speed over a Closed Circuit.

All are held by America. It is interesting to note that one of the oldest records in the current list is the World Height Record of 22,066 m (72,395ft) set up by Capt. Orvil Anderson and Capt. Albert Stevens in a balloon on November 11th, 1935. The Aeroplane Height Record of 18,119 m (59,492ft), set up by John Cunningham in a Vampire in March, 1948, is still 3,947 m (12,903ft), less than the absolute height record. In view of the importance of the powered aircraft and the obsolescence of the man-carrying balloon, it would appear that the Aeroplane Height Record should rank as a World Record. Incidentally, achievements by projectiles which do not carry a pilot do not qualify for confirmation as official records.

In 1951, a Speed Record at Great Height was established for the first time. Miss Jacqueline Cochran (U.S.A.), who figures so frequently in the record list, flew a Merlin-powered North American F-51 Mustang at 747.339 km/hr (465 m.p.h.) on April 9th, but this record loses some of its interest by the fact that the actual height at which the flight was made is, for some reason—hardly one of security—omitted from the F.A.I. Record List.

Since 1950 it has been possible to establish the World Speed Record at an unlimited height, thereby offering full scope to jet-propelled aircraft which would not develop the necessary power lower down. To date no record has been confirmed to supersede the 3½-year-old record (over the 3 km straight course) of Maj. R. L. Johnson, who flew an F-86 Sabre at 1,079.841 km/hr (671 m.p.h.) on September 15th, 1948. Doubtless the question of security underlies the fact that no new attempt has been made. Many people

PLACED ON RECORD . . .

in this country, also, feel that the expenditure of time, money and effort entailed by such record attempts could seldom be justified in such times as these.

Incidentally, records for jet-propelled aircraft now fall in Class C.I (Aeroplanes) Group I, instead of Group II, which now accommodates records by piston-powered aircraft—a reversal of the previous designation.

Records for light aeroplanes were formerly limited to certain speed, height and distance achievements, but the following additions were made in 1951 for achievements in each of the weight categories C.Ia-C.Ie:—

(1) Distance Record in Closed Circuit without Landing.
(2) Speed Records over Closed Circuits of 5,000 km and 10,000 km.
(3) Point-to-point Speed Records.
(4) Round-the-World Speed Record.

None has yet been established, with the exception of a Point-to-point Record in Class C.Ib (500-1,000 kg). This was set up by Capt. Jan Christie of Norway between London (Croydon) and Stockholm (Bromma); on September 23—the day after he gained third place in the South Coast Air Race—he flew his Klemm Kl 35D at an average speed of 175.723 km/hr (109.1 m.p.h.), taking 8 hr 9 min 48 sec for the flight. He followed the coast, otherwise a higher speed would have been shown.

The other light-aircraft achievements in 1951 are best indicated in their weight categories:—

Class C.Ia (up to 500 kg).—The Distance Record was substantially increased—to 1,826.961 km (1,135 miles)—by Albert Rebillon (France), flying a Minicab G.Y.20 (65 h.p. Continental) from Paris to Rabat, Morocco. He nearly doubled the previous record of Albert van Cotthem (Belgium), who, with a 60 h.p. Tipsy Belfair, flew the 945 km (588 miles) between Brussels and Biarritz in August, 1950.

The Height Record was pushed up to 8,276 m (27,180ft) by Mrs. Luisa Branger of Venezuela, flying a 125 h.p. Piper monoplane.

Class C.Ib (500-1,000 *kg*).—America took the Height Record by Mrs. Caro Bayley's climb to 9,206 m (30,200ft) in a Piper PA-18 (Lycoming).

In France, Mlle. M. Nicolas flew a Régnier-powered Norécrin at 255.815 km/hr (159 m.p.h.) over the 500 km Closed Circuit on December 1st, and four days later beat her own record at 264.304 km/hr (164.3 m.p.h.). Also on December 5th she beat the 1,000 km Closed Circuit Record held by Russia's Yacov Forostenco at 262.786 km/hr (163.4 m.p.h.), again flying the Norécrin.

Capt. J. H. Christie, a D.N.L. pilot, checks over the Hirth engine of his elderly Klemm Kl 35D at the washed-out South Coast Race last year. When the contest was finally flown, over a month later, Capt. Christie gained third place, and then established an international point-to-point Class Record on the way back to Sweden.

A typical Yak-18 trainer of the type which established a number of Closed Circuit Records for Russia last year.

Count Bonzi's Ambrosini S.7. On December 21st, he flew a Gipsy-Queen-powered version round a 100-km course to gain an international Closed Circuit Class Record for Italy. A similar machine, but Alfa-powered, was air-tested by "Flight" last August.

Class C.Ic (1,000-1,750 *kg*).—Nat Somers lost his 100 km Closed Circuit Record (set up in his Gemini during the 1950 King's Cup race) to Count Leonardo Bonzi, who flew his Ambrosini S.7 at 358.637 km/hr (223 m.p.h.)—an increase of 87.553 km/hr (54.5 m.p.h.)—on December 21st.

A Russian pilot, Nikolai Kouznetzov, flew a Yak-18 over the 500 km Closed Circuit at 251.823 km/hr (156.2 m.p.h.) on October 11th.

Capt. Christie had held the 1,000 km Closed Circuit record in a Caudron Goeland at 223.076 km/hr (138.8 m.p.h.) since March, 1950, but lost it to Russia's Miss M. Drigo on September 30th, 1951, when she flew a Yak-18 at 237.856 km/hr (147.8 m.p.h.). She in turn was beaten by Count Bonzi, again flying his Ambrosini, on December 21st, when he reached 347.802 km/hr (216 m.p.h.).

Russia added another record to the list when, on September 16th, Vladimir Pantchenko flew over the 2,000 km Closed Circuit at 209.664 km/hr (130.1 m.p.h.) also in a Yak-18.

Class C.Id (1,750-3,000 *kg*).—Yacov Forostenco (Russia) improved on his 500 km Closed Circuit Record on July 12th by attaining 471.348 km/hr (293 m.p.h.) in a Yak-11, and on August 20th, Nicolay Golovanov flew a similar type at 442.289 km/hr (274.9 m.p.h.) over the 1,000 km Closed Circuit.

Class C.Ie (3,000-4,000 *kg*).—No new records were made in this class; in fact the only record standing is the 100 km Closed Circuit made in 1950 by Peter Robarts in a Spitfire Trainer at 528.634 km/hr (328.3 m.p.h.).

Seaplane Records (Class C.II).—Only one seaplane record (in sub-class C.IIb—light seaplanes of 600-1,200 kg weight) was established: Harold Mistele (U.S.A.) set up the first height record in this category by flying an Aeronca floatplane to 6,148 m (20,180ft) at Detroit on September 3rd. There are no other records standing in this category.

The oldest record standing (apart from Balloon Records—Class A) in the official *Record List* is in fact a seaplane record: the 100 km Closed Circuit made by G. Cassinelli (Italy) on October 8th, 1933; this pilot flew a Macchi M.72 (of the type which held the World Speed Record for so long) at 629.370 km/hr (390.5 m.p.h.).

The Macchi-Castoldi M.C.72 is chiefly remembered as the one-time holder of the Absolute Speed Record; what is less well known is that it still has the seaplane 100-km Closed Circuit Record to its credit, established at 390 m.p.h. by G. Cassinelli on October 8th, 1933.

Gliding Records (Class D).—Some notable achievements were made in the gliding world, although Great Britain does not appear at all in the current list.

The Distance in a Straight Line Record (in the single-seat Class D/1, category) was taken from Russia by America, when, on August 5th, R. H. Johnson flew a Ross-Johnson sailplane from Odessa, Texas, to Salina, Kansas, a distance of 861.272 km (535.8 miles).

Speed over the 100 km Triangular Course was raised by Russia to 77.144 km/hr (48 m.p.h.). The pilot was A. I. Mednikov, who, flying an A-9 sailplane, increased Siegbert Maurer's (Swiss) record by 8 km/hr (4.96 m.p.h.).

In the two-seat category (Class D/2) the Absolute Height Record was increased by Robert Symons (U.S.A.) with Dr. J. Kuettner as passenger, to 11,675.4 m (38,220ft) and the Speed over 100 km Triangular Course was taken by France when Capt. R. Fonteilles and M. René Lamblin flew a Kranich at 65.981 km/hr (41 m.p.h.) at Le Bourget du Lac, an increase of 21 km/hr (13 m.p.h.) over the record held by America's William Briegleb and Jack Lamare.

The Gain of Height Record, held by Poland, has now been beaten by America, but at the time of writing has not been confirmed by the F.A.I.

Helicopter Records (Class E—formerly Class G).—No new helicopter records were established. All of the eight existing records are held by America and were in fact all set up by Sikorsky designs. Most builders of helicopters are busy putting their experience to commercial and/or military use.

Point-to-Point Records.—In contrast to the comparatively large number of Point-to-Point (or "Course") Records set up in 1949 and 1950, only two were established last year. The Canberra, piloted by W/C. R. P. Beamont, flew the Belfast-Gander course on August 31st, at 774.255 km/hr (481 m.p.h.), comfortably exceeding the previous (unofficial) flight between the two points. The other Point-to-Point Record made was Captain Christie's, mention of which has already been made.

Airliner Speed Records.—Point-to-Point Speed Records for Airliners on scheduled flights are now recognized by the F.A.I. This innovation will enable, for example, some fast crossings of the Atlantic to be officially recorded, provided they are properly observed. There is no "Atlantic" record as such; from time to time the general Press refers to a new Atlantic record made by one airline company or another, but such flights do not count officially. Airliner Speed Records, when confirmed, will be in the name of the pilot and of the operating company.

Women's Records.—Flying women have again been busy in various parts of the world, and last year, for the first time, a speed record was established by a woman flying a jet-propelled aircraft: Mme. Jacqueline Auriol flew a Vampire over the 100 km Closed Circuit on May 12th at 818.181 km/hr (508.8 m.p.h.). Mention has already been made of Miss Cochran's *Vitesse à Grande Altitude* record.

All the other *Records Féminins* were in Class D (Gliders) and made by French and Russian pilots.

In the single-seat category, Miss Marina Pylaeva, flew an A-9 from Grabtsevo to Kourakino and back—226.290 km (141 miles) and so beat the Distance to a Fixed point and Return record, formerly held by Mme. Choisnet-Gohard of France, an increase of 23 km (14.4 miles). The Distance to a Fixed Point was also taken by Russia, while France's Mme. Yvonne Gaudry set up the Absolute Height and Gain of Height records.

In the two-seat category, Mme. Choisnet-Gohard again came to the fore, flying with Mlle. J. Queyrel as passenger in a Castel-Mauboussin sailplane, and took the Absolute Height and Gain of Height Records, the latter from Poland. Then, on November 22nd, with Mlle. Yvette Mazellier as passenger, she increased the Duration Record to 28 hr 41 min—a substantial improvement on the existing figure of 16 hr 3 min set up by France in 1947.

Model Records.—Once again Russia, and the other countries hidden behind ferrous drapings, flooded the list of Model Records with achievements, pushing up the World Duration Record to 5 hr 10 min and the Distance Record to 356.794 km (222 miles). Russia also holds the Height Records set up in 1949, of 4,152 m (13,120ft). Many other records were gained in the various categories and one is often asked why is it that the Soviet Union manages to establish such outstanding performances. The reason, briefly, is that the State gives considerable aid to the modelling movement, even to the extent of providing piloted aircraft to observe the attempts, so that the models are not lost to view as they probably would be in other countries.

The World Record for Speed in Circular Flight was increased by France to 231.270 km/hr (143.5 m.p.h.), on October 25th, when Gérard Laniot's model, powered by a 9.87 c.c. glow plug Micron 60, engine, set up the record.

Future Prospects.—The establishment of records in 1952 will most probably depend entirely on the enterprise of private pilots and on a recognition of the value of adding the name of Great Britain to the international record list by manufacturers. When the Air Ministry arranged the delivery of the Canberra to the Martin company in February, 1951, the Royal Aero Club was not asked to observe the flight. But, perhaps because of the adverse criticism which this negligence occasioned in the national Press, the next flight, organized by the English Electric Company on August 31st, became the subject of official observation and F.A.I. confirmation.

It seems most probable that more records this year will be made in the light aeroplane classes by private pilots—that is, those of them who can afford the time and money—and by the early summer it is expected that further achievements by British pilots will find their way into the *Record List*. At least one pilot is contemplating attempts on various Point-to-Point Records.

FORTHCOMING EVENTS

Jan. 28–Feb. 1. Institute of the Aeronautical Sciences: 20th Annual Meeting New York.
Jan. 28. R.Ae.C.: Courtenay Film Show.
Jan. 29. Society of Instrument Technology: "Mechanical Consideration in the Design of Servo Systems," by Prof. A. Tustin.
Jan. 31. R.Ae.S. Section Lecture: "Problem of Short-haul Air Transport," by P. W. Brooks, B.Sc., A.C.G.I., A.F.R.Ae.S.
Feb. 7. R.Ae.S.: "Availability and Use of Aeronautical Information" (Joint Discussion with ASLIB).
Feb. 11. Institute of Transport: Brancker Memorial Lecture: "The Flying-boat and its Place in Aviation," by Air Chief Marshal Sir Frederick Bowhill, G.B.E., K.C.B., C.M.G., D.S.O.
Feb. 12. R.Ae.S. Section Lecture: "Flight-test Problems for Civil Aircraft," by B. P. Laight, B.Sc., A.F.R.Ae.S.
Feb. 12. R.Ae.C.: Film Show.
Feb. 13. Royal United Service Institution: "Long-range Jet Flying," by S/L. A. E. Callard, D.F.C.
Feb. 14. R.Ae.S. Graduates' and Students' Lecture: "Radar," by B. W. Hodlin, B.Sc.
Feb. 15. Institute of Navigation: "Navigation Aids for Military Aircraft," by S/L. D. Bower.
Feb. 19. R.Ae.S. Section Lecture: "Glider Design," by K. G. Wilkinson, B.Sc., D.I.C., A.F.R.Ae.S.
Feb. 20. Aircraft Recognition Society: "The Exploration of Space," by A. C. Clarke, B.Sc.
Feb. 20. British Institution of Radio Engineers: "Search Radar for Civil Aircraft," by P. L. Stride.
Feb. 21. R.Ae.S.: "Power Steering for Aircraft," by K. G. Hancock, B.Sc., A.F.R.Ae.S., and P. Person, M.A., A.F.R.Ae.S. (at Brough).
Feb. 21. R.Ae.C.: Courtenay Film Show.
Feb. 21. Aerodrome Owners' Association: Annual General Meeting.
Feb. 22. Helicopter Association: "Helicopter Power Plants," by A. Graham Forsyth, B.Sc., F.R.Ae.S.
Feb. 23. Society of Licensed Aircraft Engineers: Main Lecture: "Some of the Responsibilities and Problems of an Airworthiness Authority," by R. E. Hardingham, O.B.E., F.R.Ae.S., M.S.L.A.E.
Feb. 26. R.Ae.C.: Courtenay Film Show.
Feb. 26. R.Ae.S. Graduates' and Students' Lecture: Gliding and Meteorology Symposium.

ATTACKING the TSETSE-FLY

A Note on Aerial Spraying Research Operations in Tanganyika

THE technique of crop-spraying is now well known; not so familiar is the treatment of uncultivated areas to put down such formidable pests as the tsetse-fly, carrier of disease to man and beast. This short article is by Captain E. C. Jaques, of Airwork, Ltd., who have a spraying contract of this kind in Tanganyika; it was written last December, during an interlude—used for research—in the active operations.

FOLLOWING on the end of the 1950-51 contract and the unfortunate loss of one of the Ansons, a revised programme of spraying operations has been drawn up. A scheme for clearing a hundred square miles of tsetse-infested bush in the gold-mining area near Musoma (on the south-east shore of Lake Victoria) must in any case await the arrival of the replacement Anson. Meanwhile, a number of basic research problems are being investigated, with the familiar pattern of extensive ground work and scattered flights—usually pre-dawn—and low overall flying hours.

The ratio of take-offs and landings to flight time is, however, anything from five to ten times that of the more normal operations. Whilst one must acquire special muscular development to deal with frequent undercart winding, there is much to be said for the sturdy but simple Anson construction in this land of improvised airfields and meagre facilities.

We have developed a technique of aerial photography, processing and map-making, and now have the advantage of bringing remote and sometimes trackless bush areas under examination in our offices. To ourselves and a number of Government departments concerned with territorial development this is a promising step forward, since detailed survey work is almost non-existent.

One series of trials is now taking place at Kikore, the scene of earlier spraying cycles. This time we are spraying Atta Island (so-called because the bush stands isolated on an island of land rising from the surrounding plain) to the point when the last fly has been eliminated. Here it should be said that to kill 98.5 per cent of the fly population is relatively simple, but that the odd 1.5 per cent, remaining a potential reinfestation danger, can give much trouble in elimination.

Another important factor is the direction of spraying runs, because, due to the possible movement of flies between sprays—usually during the period from one dawn to the next—the amount of overlapping spray coverage required may, if the spray runs are long, tend to exceed the area which can be covered by our single aircraft payload.

On a first inspection of our private airstrip at Kikore prior to the present trials, we found fresh rhino tracks, crossing the wet earth of the strip. This may indicate a previous inhabitant, and no doubt we shall receive a personal visit in due course. Ostriches seem to have multiplied in numbers in the vicinity, possibly from the nest just off the end of the runway, where we found 34 eggs in 1950.

We are housed in some style this time, on the lower slopes of the Rift Wall, in "Rhino Hall," one of two houses built in the early nineteen-twenties by Sir Frank Swynnerton, the Father of tsetse-fly research in East Africa. The house is aptly named, for its first occupant was killed by a rhino nearby. Of late, in the dry seasons, lions and leopards are the more frequent visitors, and as leopards will travel far in any season for a toothsome morsel of dog such pets are "out" at Kikore. For all concerned it is customary not to wander outside the houses after dark. This can be inconvenient, because for reasons of hygiene and the hillside rock strata surrounding the house, our "usual offices" are perforce a quarter of a mile away.

Speaking of lions, one was reported two days ago in the Atta Island bush, roaring with apparent satisfaction after a kill, around 6 a.m. So near was he that the field officer engaged on spray-run marking duties decided to proceed in his vehicle instead of on foot. Usually lions are content with their freshly-killed food, but it is as well to be cautious when man is up-wind, as was the case in this instance.

To sum up briefly our progress to date, one can say that much has been learned of the scope and limitations of aircraft-spraying against various insects which cause trouble in East Africa. With growing specialized knowledge, the combined team can the more easily consider wider applications, including the agricultural sphere. which must play an increasing part in future economic development. There is little doubt that the often tantalisingly slow progress, which is more imaginary than real, is laying the sound foundation for future work. After the groundnut scheme, who can wonder at the caution of Government researchers when faced with complex problems of this tropical land of extremes and contradictions?

At the time of writing, the grass is green and lush around Arusha and one swelters in the afternoon heat. Meantime, snow appears on the peak of Mt. Meru, not more than 15 flight-miles away, and the glaciers of Kilimanjaro emerge most evenings from their cloud-mantle, 50 miles to the East. In the last month or so some areas have had more than the average annual total of rainfall at Kew; yet we can expect to see in January and February thousands of square miles of dried grass, breeding fires and dust spirals. In step with these seasons, which vary throughout the territories with distance and ground level, we must learn to gauge our attacks on the insect plagues.

BRITISH ENGINES BUILT ABROAD

MORE than at any previous time, British aircraft engines are scheduled to be, or are being, manufactured in foreign factories. Presented here is a list—based primarily on information from the S.B.A.C.—of all the licences to build which, to our knowledge, are current between engine manufacturers in this country and overseas. These licences are sometimes valid for a given period, or may refer to a specified number of power plants, or they may give the licencee a completely free hand, according to the terms of the agreement.

Argentina.—Rolls-Royce Derwent (for fighters). Note: The Pulque II fighter is at present fitted with a Nene; these Derwents are possibly Meteor spares.

Australia.—Rolls-Royce Avon (for Canberra and F-86 Sabre), Rolls-Royce Nene (for Vampire).

Belgium.—Rolls-Royce Derwent (for Fokker-built Meteor 8).

Canada.—Rolls-Royce Nene (for Canadair-built Lockheed T-33).

France.—Bristol Hercules (for Nord 2500 series and numerous prototypes); Rolls-Royce Nene (for Mistral—a Vampire development—and many prototypes); Rolls-Royce Tay (for Marcel Dassault fighters).

Italy.—De Havilland Goblin (for Vampires and Fiat G.80); de Havilland Ghost (for Venom).

Netherlands.—No licence; the British engines used (chiefly Centaurus and Derwent) are imported.

Sweden.—De Havilland Goblin (for Vampire and J-21R); de Havilland Ghost (for J-29).

Switzerland.—De Havilland Ghost (for Venom).

United States.—Armstrong Siddeley Mamba, Double Mamba and Python; Armstrong Siddeley Sapphire (as Wright J-65, for Martin B-57A Canberra, Republic F-84F and RF-84F, and other types); Bristol Olympus; Rolls-Royce Nene (as Pratt and Whitney J-42, for Grumman F9F-2 Panther); Rolls-Royce Tay (as Pratt and Whitney J-48, for F9F-5 Panther, F-93A Sabre and Lockheed F-94C).

R.Ae.S. LECTURE IN HULL

THE subject of an R.Ae.S. main lecture to be given in Hull on Thursday, February 21st, is *Power Steering for Aircraft*, by K. G. Hancock, B.Sc., A.F.R.Ae.S., and P. Person, M.A., A.F.R.Ae.S. The lecture hall, at the Electricity Showrooms, is within 200 yards of the Royal Station Hotel, where visitors can be accommodated. After the lecture the Brough branch of the R.Ae.S. and Blackburn and General Aircraft, Ltd., are to give a small private dinner party.

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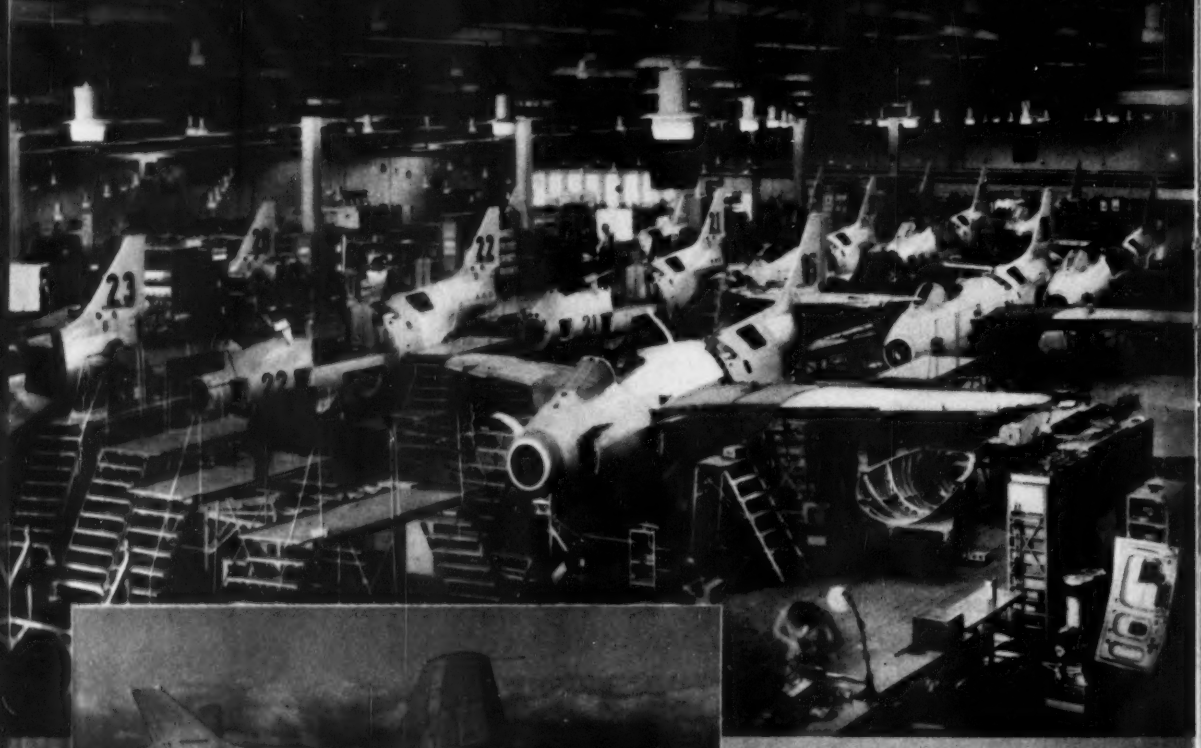

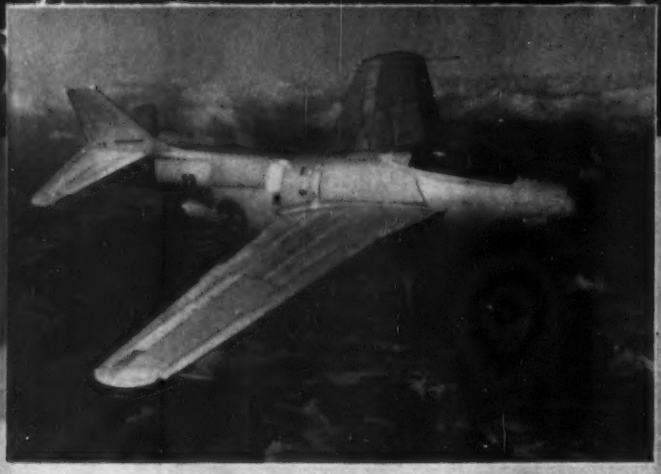

The SAAB J29 fighter in production at Linköping, Sweden

In full-scale production in Sweden to power the latest Swedish day and night fighter

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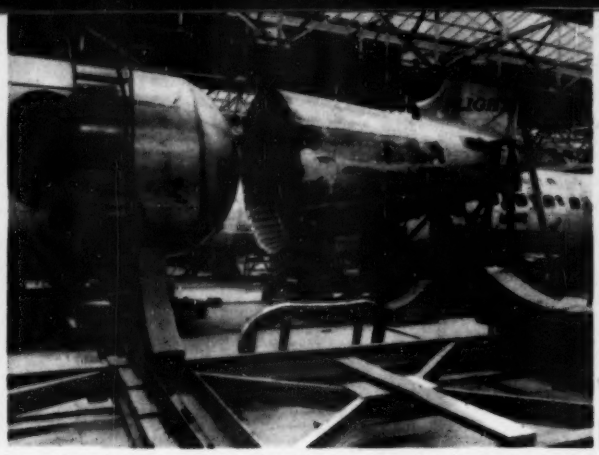
PARA-RESCUE COURSE

THREE months ago, in our "Service Aviation" pages, we reported the names of R.C.A.F. medical personnel—of both sexes—who had distinguished themselves on a strenuous 14-week course of rescue work, held at a little used air-strip in the Canadian Rockies. In charge of the pupils was an R.A.F. parachute specialist, F/O. Roy Clark of Oxford. It is now possible to publish these fine photographs, taken at the very-open-air school where such courses are held. Primarily, the training is for rescue work on crashed aircraft in remote areas, the personnel being dropped by parachute when a wreck has been located from the air. The service was started originally by employees of Canadian Pacific Airlines; then, seeing its value to both civil and Service aviation, the R.C.A.F. took it over and expanded its scope. Trainees on a course make ten jumps, six over open country and four over dense forest. As the pictures show, they must also be prepared for mountaineering and for stretcher-carrying under the most arduous conditions; they must also be completely self-sufficient. It will be noticed that their equipment includes face-guards to provide protection against branches after drops over forest-land. The lower left-hand view is photographically remarkable, showing as it does the parachute shroud-lines just beginning to slacken at the exact moment of touch-down.

Heronry : In the fuselage shop a number of Herons are taking shape, but, of necessity, civil production is curtailed by military needs.



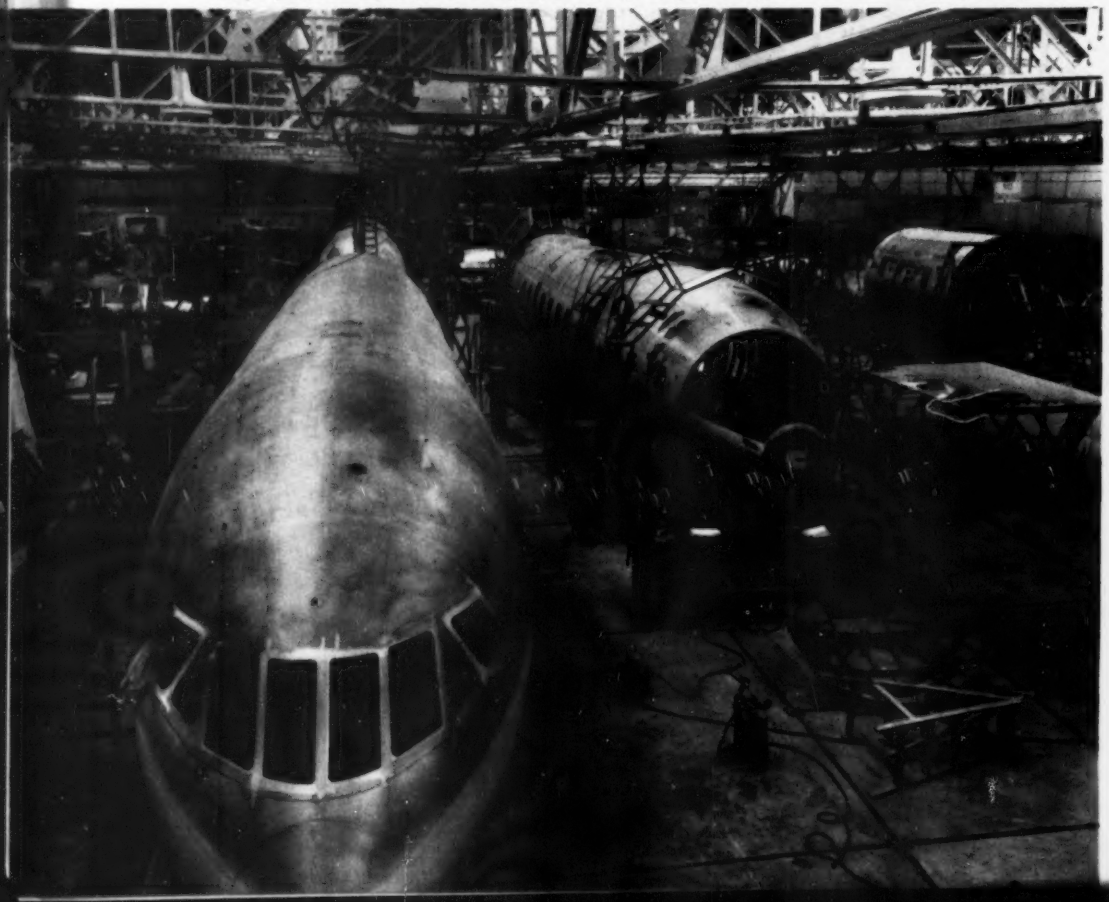
Pressurized and unpressurized : Part of the Comet erection shop, showing the rear of a pressurized fuselage about to be joined to its tail section.

IN PRODUCTIO

A Pictorial Tour through de Havilland

"FLIGHT" PH

Comet output is an encouraging sight. On the extreme right No. 20 fuselage takes shape. No. 6, clear of the line, has been fitted with Avons. The grid pattern covering the floor is a rail system on which the fuselages in their jigs can be moved to any part of the shop.



Comet tails are too high for the shop roofs, and this view is typical of many to be seen outside the Comet erecting shops. In the foreground a Ghost is being unloaded.

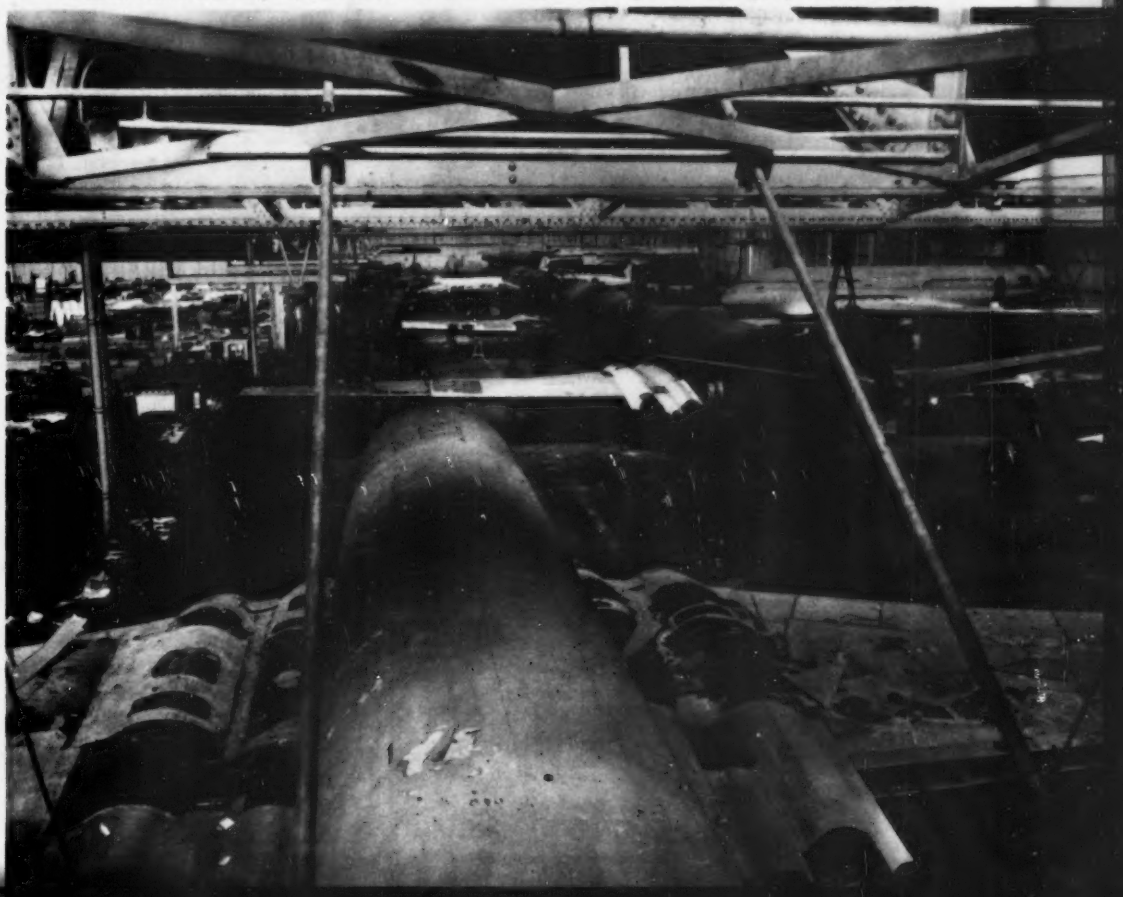
A Comet masked-off for painting in B.O.A.C. colours. Priming paint protects bright areas during final erection and test flying.

N AT HATFIELD

's Comet and Heron Production Shops

IOTOGRAPHS

This erecting-shop view—seen from a Comet fin and rudder scaffolding—emphasizes the large but carefully streamlined turbojet installations. On the left a corner of the wing shop is seen, and on the right is a Comet, its tail through the doors, being prepared for painting.



The author and her pilot—Mr. K. G. Hamnett, president of the Kuala Lumpur Flying Club—load the money-bags into a club Auster.

By MARJORIE STAPLETON

REFERENCES have previously appeared, in our "From the Clubs" column, to the fine effort organized by members of Malaya's flying clubs (Kuala Lumpur, Penang and Royal Singapore) for dropping wages to the rubber estates, and to gold and tin mines, situated in bandit-infested territory. To carry the money by road would mean almost certain robbery, and probably death; even the aircraft have occasionally been fired upon. The flights regularly made extend up to about 100 miles each way. In this entertaining article, Marjorie Stapleton—who is secretary of the Kuala Lumpur Flying Club—explains what the job entails.

A DROP IN WAGES

Personal Picture of one of the Malayan Flying Clubs' "Money Runs"

CAN you picture the Tiger Moths and Austers of the Malayan flying clubs, piloted by volunteer pilots, flying out day after day over the humid jungle to drop wages to countless thousands of Malay, Indian and Chinese rubber and tin-mine workers in the bandit-infested areas?

A call comes through to the nearest flying club, saying that a certain mine or estate requires, say, a quarter-of-a-million dollars dropped at a certain time. The secretary telephones the pilots, and finds someone who is able to drop his own work for a few hours and rush out to the club to take an aircraft into the air.

Of course, a "dropper" is also needed, and it is through acting both as a dropper and a club secretary that I am in a position to know this pay-dropping business from beginning to end—and to respect it enormously. The Kuala Lumpur Flying Club alone has dropped nearly one hundred million dollars in hard cash during the emergency.

My excitement began on the day I first asked permission to do the dropping. "Are your wrists strong?" the club committee asked me. "You might have to hold a heavy bag against a 95-mile-an-hour gale."

My dreams on the last night of waiting were hectic. I was dropping bags all the night. Sometimes they fell into lakes, sometimes into the hands of bandits. Once, when the drop looked so easy, my fingers locked on the bag and would not let it go. In yet another dream the money-bag pulled me out with it. I went to the air-strip next morning opening and shutting my hands.

The pilot, Mr. K. G. Hamnett, O.B.E., who is president of the Kuala Lumpur Club, and federation commandant of the new Air Training Corps, was waiting beside the Auster and our rehearsal began. I tried out the bags in my hand, felt much more confident of holding them, and then listened to the instructions.

"When I say 'Get ready,' put the bag overboard, minding the wing and holding the bag in both hands. Grip it tightly. Then, when I say 'Drop' you drop, and you shout 'Away'."

Yes, I thought, I'll drop. I'll probably drop dead.

The bags were threaded on a rope inside the aircraft. The dropper's job is to untie the rope, lift off a money bag, without letting it touch the floor (as the weight of the coin would be sufficient to carry it through the structure), re-tie the rope to a fuselage-member above your head, and sit with the first bag tightly held on your knee until the word comes to get ready.

Then we climbed in, fixed our straps, taxied over the air-strip, and took off. Dawn had broken and the morning air was fresh and ground-misty. Kuala Lumpur was spread out below us like a toy town with dolls in national costumes walking about the streets. Its Saracen domes and minarets, and the gleaming whiteness of the mosque, were very lovely in the day's first light.

Mining holes gaped around the town, then we came to the softly rolling and feathery rubber, and beyond it to the jungle. The jungle, which looks so monotonously green from the ground, is full of colour when seen from the air.

We flew for nearly an hour with no landing ground but the tree-tops should we meet with trouble. Then the pilot said: "There it is!" and there was a little settlement, with the identification mark laid out in white for us on the manager's front lawn.

"Can you see our reception committee?"

"Not yet."

We circled around twice, making a great noise, and then saw them: the manager, four armed guards and several assistants. At a discreet distance the labourers stood, their eyes turned to the skies. Women came to the doors of their dwellings, and children clustered around their skirts, and all eyes were lifted.

It made one feel quite important that they should all be waiting for us in this tiny aircraft, and that if we failed their salaries would be lost. Their only other connection with the outside world was the telephone line—cut so often by bandits—and the sinister little road which wound away through a jungle of terror.

The pilot circled again, lost the necessary height, and the *kongsi* houses rushed up at us. "Get ready!" he shouted above the wind.

Up went the money-bag and over the side. Though I gripped it with both hands, and it was a heavy bag, it trailed out horizontally beside the aircraft in the slipstream. We flew low over the identification mark, and the next order came.

"Drop!"

It dropped. "Away!" The engine roared and we climbed again.

We circled around over the "spot marked X" again, and saw that the bag had been picked up and was being escorted along the ground by the armed guards. The identification mark was being rolled up and put away.

On we flew, and I untied the rope above my head and took off the second money-bag. This drop was on to a much smaller space, and surrounded by trees, which meant that we could not fly so low. The wind was strengthening and the bag was lighter.

It was not long before the Get Ready and the Drop came again. I felt that the wind would seize the money and take it miles away, but it was not far off the central target after all. We looked back and saw a guard pointing to the bag with the business end of his shot gun, and in a second they had picked up their pennies from heaven. Before long the bag would be

(*Concluded at foot of page* 133)

PERFORMANCE with RELIABILITY

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The works at Finale Ligure. Beside the sea are the design offices, assembly halls and quay; between the road and railway are workshops and stores; at the extreme left, beyond the railway, are heat-treatment shops and another block of machine-shops.

By
JAMES HAY STEVENS

ITALIAN PRIVATE ENTERPRISE

A Visit to the Piaggio Factory: Its Products Reviewed: Flying the P-136 and P-148

AT the last two Paris Salons the Italian Piaggio company has shown prototypes that were generally agreed to be among the most workmanlike exhibits of the whole show. In 1949 there was the P-136 light amphibian and last year the P-148 two-seat trainer.

Although a limited company, the concern is a family business and is controlled today by Ing. Armando and Dr. Enrico Piaggio, sons of Rinaldo Piaggio, who founded the firm in 1884. The original factory in the Sestri suburb of Genoa was engaged mainly on woodwork and the furnishing of liners, but by the turn of the century manufactured a great deal of railway rolling-stock. In 1915 the construction of aeroplanes was begun and many F.B.A. flying boats were built for the Italian Air Force in the First World War. Aircraft work did not stop with the coming of peace and in 1923 the first original design was built, the P-2 single-seater monoplane fighter. During the twenties and thirties a number of aircraft were built as prototypes. Many of these were remarkable for originality of outlook; in fact, it would not be unfair to say that Piaggio have been more notable for quality of production than for quantity.

Between the wars the firm acquired licences for both Bristol and Gnôme-Rhône radial engines, from which they developed about sixteen radials of their own design, ranging from 370 to 1,750 h.p. Several of these engines were built in quantity for the aircraft of the Regia Aeronautica. Yet another activity of this versatile company was the design and manufacture of variable-pitch airscrews—a side that is continued on a small scale today.

The Piaggio concern expanded rapidly and by 1940 there were seven main plants, of some 3,250,000 sq ft area. During the war two of them—at Pontedera and Pisa—were badly damaged, although most of the firm's total of 2,000 machine-tools were saved and the number has since been brought up to nearly 3,000 by imports from the U.S.A. Despite the economic difficulties in post-war Italy, judicious management has preserved the concern as a well-equipped and organized industrial group with an excellent production potential.

One of the technical directors is Ing. Coradino d'Ascanio, who will be remembered as a pioneer of the helicopter. It was he who, asked to make an economical motor-bike, designed the unconventional Vespa, now built in very large numbers in Italy, and made under licence in France and Great Britain and Germany.

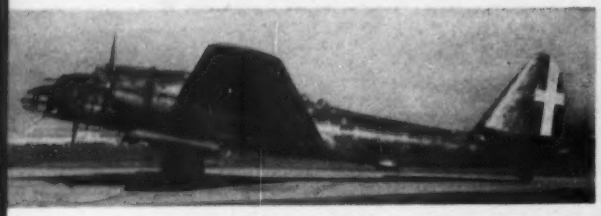
A few of the highlights of Piaggio aircraft work in the past may prove interesting.

By acquiring, in the middle twenties, a licence to built the Dornier Wal flying-boat, the firm introduced all-metal, stressed-skin construction to Italy. Then, in 1929, they designed and built the unconventional P-7 Schneider Trophy seaplane. This was a truly remarkable type and, had today's knowledge of clutch design and shaft drives been available, it might well have proved successful. It was a more-or-less straightforward, clean, shoulder-wing monoplane with a tractor airscrew. However, instead of being fitted with floats it had small hydrovanes and a marine propeller at the tail, driven from the 970 h.p. engine. At rest, bouyancy came from the fuselage (or hull, if you like) and the wing. As it taxied under the thrust of the marine propeller the hull was intended to lift clear until the airscrew could be engaged to augment the thrust and raise the speed until the wing could lift the aeroplane off the water. Today, over twenty years later, we see the same idea simplified, made practicable by the jet power unit and exemplified in the Convair Skate project.

In the thirties Piaggio designed and made several two-, three- and four-engined bombers, culminating in the 29-ton P-108B, which was built in quantity for the Regia Aeronautica. These various types were all fitted with slotted flaps, while the three-engined P-23R and the twin-engined P-32 were the first aircraft to be fitted with double-slotted high-lift flaps.

The P-108 seems to have been a good aeroplane and quite a large number were built. A 32-passenger pressurized commercial version was designed for L.A.T.I.'s South Atlantic service in 1940, but, because of Italy's entering the war, the fifteen examples built were used as troop transports. In 1943 the proto-

The remarkable Piaggio conception of a Schneider Cup seaplane in 1929. Initially driven by a marine propeller, the hull gradually rose out of the water and became airborne, the airscrew being clutched in as soon as there was sufficient clearance for it to revolve.



(Left) The P-108B bomber of 1939 (four 1,500 h.p. Piaggio 18-cylinder radials). The lines are as distinctive as the several turrets—in the nose, two above the wing and a retractable dustbin below. Span, 105ft; length, 75ft 2in; gross weight, 64,900 lb; max. bomb load, 8,000 lb; max. speed, 270 m.p.h. at 14,000ft; range with one ton of bombs, 2,250 miles. (Right) The P-111 "stratosphere" research monoplane of 1941 (two Piaggio 1,200 h.p. 18-cylinder radials). Span, 56ft 9in; gross weight, 16,698 lb; max. speed, 360 m.p.h. at 33,000ft; service ceiling, 40,000ft.

ITALIAN PRIVATE ENTERPRISE . . .

type was adapted to take a 102 mm gun for anti-submarine work.

In 1939 Piaggio designed a twin-engined high-altitude research monoplane, the P-111, which flew on April 9th, 1941. This was a neat little aircraft, with a cylindrical pressurized cabin, and was certainly one of the first to be used for systematic high-altitude research—though it was scarcely stratospheric in performance. From the point of view of the makers it was a proud achievement, since it was all-Piaggio—airframe, engines and airscrews. Today its parts lie, sadly corroded by sea air, in the storage hangar of Finale Ligure.

Also in this hangar, with its skin now fretted like lace, is the prototype P-119 fighter bomber, which first flew on December 19th, 1942. This was another unconventional approach, since it had a buried engine, in the manner of the Airacobra. What was remarkable about the P-119, however, was that an air-cooled radial had been chosen, cooling air for which entered by a radiator-like ventral scoop under the nose and was exhausted from gills round the mid fuselage.

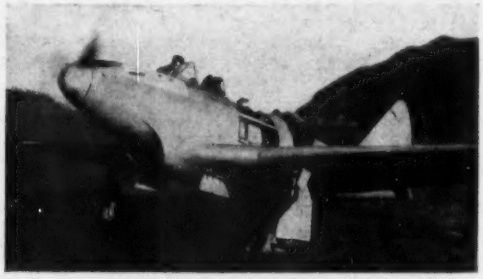
In 1940, a two-seater, single-rotor helicopter, the PD-3, designed by Ing. d'Ascanio, was successfully flown—the first in Italy—and today a new helicopter from the same engineer, the PD-4, is almost completed at Pontedera.

As well as original design work—which covered a very wide field, as can be seen from the picture of the wind-tunnel-model store—and the manufacture of their own aircraft, Piaggio have built numerous types under licence. Probably the most important of these contracts were for the related Cant Z-506 seaplanes and Z-1007 bombers.

Turning to Piaggio activities today it must first be said that, within the contracted economy of post-war Italy, aviation has had a small and by no means stable position; realizing this, the firm has not relied upon its aviation activities for its profit. Apart from Ing. d'Ascanio's experimental helicopter development unit at Pontedera, aeronautical activities have been withdrawn into the factory at Finale Ligure. Here there is a nucleus technical staff under Ing. Edy Fieschi, Ing. Alberto Faraboschi and Ing. Pietro Ruggieri, who are responsible for all aviation activities to Dr. Giovanni P. Casiraghi, director of the aviation division.

Finale is a small seaside resort deposited on a tiny shelf of flat land between the cliffs of two capes of the Ligurian Riviera. At the west end of the town stands the factory, divided into three parts by the coast road and the railway. It looks small, broken up like this and connected only by subways, but in actual fact it covers nearly forty acres. There is no space at Finale for an airfield; nor is there a slipway, and a crane lifts seaplanes.

All landplanes built at Finale are taken along the coastal road to Villanova d'Albenga Airport, some twenty miles away. At Albenga there is a small alluvial plain caused by the river, and it



The P-119 fighter-bomber of 1942-43 with "buried" Piaggio radial of 1,700 h.p. Span, 42ft 8in; gross weight, 9,020 lb; max. speed, 400 m.p.h. at 22,300ft; service ceiling, 41,340ft; climb to 20,000ft, 7 min 15 sec; range, 940 miles at 340 m.p.h. and 20,000ft; armament, one 20mm airscrew-shaft cannon, four 0.5in synchronized machine-guns.

is upon part of this, about five miles inland, that the airport has been built. Foothills of the Ligurian mountains lie along the east and west sides and come almost to the perimeter track. Southward there is a clear approach from the sea; from the north, one comes in to land down a valley with hills rising close on either hand, while from the west a curved approach by another valley is possible. There is one (north-south) runway, surfaced with small sharp flints, and the grass area is rather rough. The runway length is about 1,000 yards only.

I have described the airfield in detail because it is worth remembering that from it were tested bombers up to 30 tons in weight. It may be only coincidence that Piaggio's should have been pioneers of high-lift flaps, but it may well have been a sub-conscious reaction to their own airfield.

When I made my visit last autumn a first production batch of P-136 amphibians was being completed for the Italian Air Force and tooling for the P-148 trainer was well under way.

The P-136 was designed and built in 1949 as a private venture. As with so many light amphibians, it was hailed as "just what was needed," but the orders did not come in—despite extensive demonstrations throughout Europe. King Farouk bought one, beautifully turned out in green and white, for his large and heterogeneous personal fleet and it is popular with his personal pilots for flights from Cairo to Port Said. The prototype and a production aircraft remain with the company as demonstrators. The fifteen series aircraft have been equipped as full dual-control trainers with seats for a crew of four.

During a short tour of the Riviera in a P-136 I tasted the pleasures of air travel in a type with a perfect view. The noise

A Cant Z-506 seaplane built by Piaggio at Finale Ligure, where a crane has always performed the functions of a slipway.

The prototype P-148 trainer on the flinty perimeter track at Villanova d'Albenga. The whole airfield lies between the aircraft and the nearest of the hills seen in the background.

(Right) Wind-tunnel models of some Piaggio projects of the last quarter-century. Many of the models are quite radical in conception.

level is, admittedly, a little high because of the pusher propellers, but it has a not unpleasant drone.

The controls are light and well harmonized and the P-136 is easy to fly, both level and in turns, despite the fact that one sits ahead of the wing and the nose slopes sharply down. Cruising speed with the 215 h.p. Franklins is about 150 m.p.h.

Unfortunately, no sea alighting was possible—although conditions were perfect—because there was no launch available to meet the company's regulations. Land take-off performance is the least satisfactory aspect of the P-136, partly because of the high drag of the extended undercarriage. Stalling speed is around 70 m.p.h. and acceleration is rather slow, so that the airfield boundary comes very close as the aircraft is coaxed into the air by some fairly marked "pump-handling." Once off, with undercarriage retracted and flaps raised, speed builds up quickly and an initial climb of 1,000 ft/min is achieved.

Cockpit and instrument-panel of the P-148 trainer. The manual airscrew control handle in the centre has now been replaced by a hydraulic control.

Upon coming in to land, the effect of undercarriage and flap drag has to be experienced to be believed. When the large slotted flaps go right down one is forced forward almost in the way in which the air brakes of a Meteor throw one into the harness. The approach is very steep—it *seemed* like forty-five degrees—but the flare-out is quite good and there is quite a bit of float before the P-136 settles quite positively on to its robust landing gear.

The P-148 was available only as a prototype last summer, although by now the first production airframes must be nearly ready. Its background is worth mentioning: design-work was started at the end of August 1950, as soon as the Macchi licence for the Fokker S-11 became known, in an attempt to convince the Italian Air Ministry that there was no need to buy trainers from abroad. The first flight was made less than six months later, on February 12th, 1951—a remarkable achievement. Flight trials proved that the P-148 had exceptional flying qualities, as well as a good performance. A first order for 50 was given last summer.

The P-148 was fully described in *Flight*'s Paris Salon report, so I will do no more than say that the apparent virtues are borne out in practice. The view for flying and taxying approaches perfection; the long fuselage gives excellent control without interference from the large bubble canopy; the marked wing incidence washout and long tail make the aircraft almost unspinnable.

I spent several pleasant hours flying the P-148 and experienced that wonderful, and fairly rare, feeling of being a part of the aeroplane—like the Cossack and his horse! The light controls are well harmonized and make all aerobatics a pleasure—and one that is enhanced by the constant-speed airscrew. Take-off is short and the climb rapid. The landing is simple, with a steep angle that gives a perfect view, and after touch-down the run is so true that the P-148 will roll to a stop in a dead straight line. The oleo-pneumatic undercarriage is beautifully damped and there was no disconcerting "bucketing" when using the rough grass areas.

The stalling behaviour is exceptional, certainly among manœuvrable aeroplanes. Engine on or off, flaps up or down, and with the nose high, the P-148 stalls after slight buffeting; the nose drops gently and rises again. Sometimes a mild diving turn develops, which can be immediately corrected with the rudder. I found it almost impossible to start a spin, even with the help of full opposite aileron. As in the Chipmunk, a spin-like spiral develops, from which this aircraft tries to come out all the time.

Even the chief test pilot, Col. Comandante Aldo Gasperi, did not always succeed when demonstrating the spin. I would criticize this virtue in a trainer (while welcoming it in any other type) purely because of the faults of the average design. However, the Italian Air Force does not take its pupils very far in elementary training, so the virtue remains a virtue.

Part of the first production batch of P-136 amphibians for the Italian Air Force in their striking warpaint as seaplane trainers: silver, dark green bottom and foredecking, red "rays" on top of the wing, and red, white and green cockades on wing and hull.

THE MANPOWER BACKGROUND

A Plea for Realism

By BRIAN J. HAIMES

ARGUING that any consideration of this question is indivisible from politics and economics, Mr. Haimes proceeds to show why, then goes on to indicate some possible lines of approach to a useful answer. Whilst we recognize that his contribution is of a more political nature than the general run of articles in our pages, the subject is of such urgent importance that we make no apology for its publication.

TO say that the British aircraft industry is short of men is to emphasize what in recent months has become a truism. The urgent question is how more workers are to be brought into the industry and kept there; but one wonders whether some of the attempts to answer this question really get down to fundamentals.

In the first place, we cannot get away from the fact that manpower shortages and aircraft production are *national* problems and as such they are the very stuff of politics and economics. If one adopts the adolescent view that these are not topics for an aviation magazine one is condemned forever to a dilettante skimming of the surface of the problem or to a masquerade in which bluster disguises the absence of a tolerable solution. I do not claim any ready-made answer—the man who has that is as good as a millionaire already—but in my opinion the application of the general principles of economics and politics to the problem produces suggestions which are more nearly useful than are vague fulminations against "luxury industries". Naturally, this does not make such easy reading; but you pays your money and you takes your choice.

The favourite line in the manpower discussion is to point to the luxury goods industries and shout that they didn't ought to be allowed; as a refinement, the motor-vehicle and boot-and-shoe industries can be added to the list. On the face of it, this looks quite nice—all you have to do is to turn these industries over to aircraft production or attract their workers away from them. But isn't turning them over *en masse* going to meet with some slight opposition from their powerful managements and shareholders? For they are not only more stable industries already but are as necessary to the rearmament drive in the production of tanks and vehicles and the maintenance of morale as are aircraft in their own particular sphere. And would no opposition to all this new competition come from existing aircraft firms? Or are they, in a competitive peacetime(!) world, going to be able to rediscover the co-operative spirit which was evolved under the stress of war?

Re-direction

One need not push this line of reasoning very far to discover its absurdities. It simply is not on the cards, in a democratic state, that whole industries should be directed to new channels in peace-time. What a godsend for potential aggressors if that were to be the result of every threatening move they made! The Communist ideology thrives on poor living conditions and one of the inevitable results of gearing a national economy to war production is a reduction of the standard of living. If Stalin can achieve this in the western countries every time he shouts boo, he need never fight a shooting war.

The alternative is to shift labour into aircraft production, and this can be achieved in only two ways—by direction or by persuasion. The late Labour Government regarded any attempt to direct labour in peace-time as political suicide, and there is every reason to doubt whether the present Conservative Government could pass legislation of this kind—and still stay in office—when it is so contrary to their stated principles. But supposing such a policy could be successful, how efficient is forced labour likely to be? Even with directed labour there is still a housing shortage to be overcome and one can envisage the monotonous story of strikes, complaints, bad workmanship and perhaps sabotage which would ensue. And there is no doubt that it would be encouraged by Communist agitators in every possible way, so that the resultant disturbance might be much worse than the present shortage.

How would persuasion work? Put simply, you attract labour by offering better working conditions and one main way of doing that is to offer higher wages than are earned in comparable jobs elsewhere. But higher wages mean higher prices for the aircraft unless profits and/or dividends are cut. Can our aircraft firms maintain their sales with higher prices? Probably they can in the civil field so long as their products are several steps ahead of competing types; but here the factor of foreign demand enters: will foreigners prefer better aircraft at higher prices or will they tend to make existing equipment last longer and then settle for older-fashioned but cheaper machines—which may not be British? In the case of Service machines the problem is simpler—the taxpayer pays. But he may not like it and he may express his dislike forcibly at the polls.

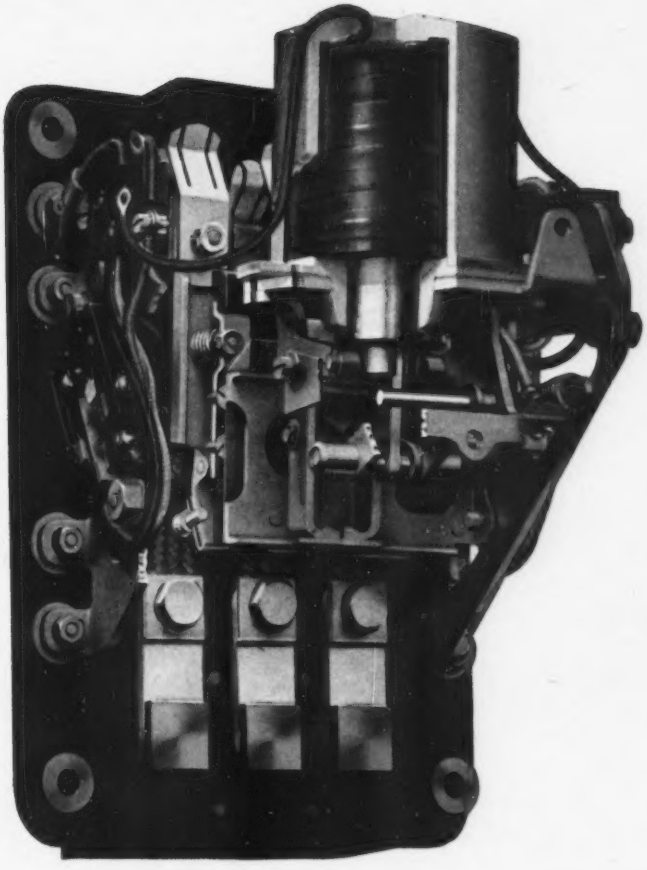
But, I hear you say, what about this matter of housing? If housing is "politics" and therefore a sacred cow which must not be discussed in aviation circles, then there is no more to be said. On the other hand, are house-building facilities to be linked to vital works on rearmament? In other words, are you to get a house, a flat or priority on the list because you have a job in an armaments factory? Our highest production estimate is 300,000 houses a year and at that rate it would be a long time before even house-hungry armaments workers were satisfied—regardless of all others. In a democratic state, Eliza Doolittle's classic answer applies. To me, it sounds more like the Soviet Stakhanovite system gone mad.

Beyond Control

The trouble is that these solutions merely scratch at the surface of the problem and I suggest that farther down there is one very important factor which is not sufficiently recognized. This is that the aircraft industry in its military aspect is inherently unstable and that its trade cycles are an index of the instability of international politics—a factor which is beyond the control of any government except the one which threatens aggression. In its civil aspect the industry falls into two categories—that of production for the home market and that of production for export. The first of these is itself a luxury industry if ever there was one, and quite a good case can be made for cutting it to the minimum necessary to give our airlines world supremacy so far as their equipment is concerned. Only a minute proportion of the population can afford to own aircraft or even fly club aircraft. Rather more can afford to fly by our airlines, but these contribute practically nothing to their own overheads, and nothing either to Government revenue on internal account or to the credit side of the international balance of payments. They can be justified only on strategic grounds as keeping Commonwealth communications open, or, more directly, on economic-strategic grounds as enabling a nucleus of designers, technicians and operators to be kept together for war purposes. There is also prestige to be considered—if you think this of itself is a worthy object of colossal expenditure.

With regard to its export aspect, the aircraft industry is in the dicey position of all export industries—this group is always the first and hardest hit in a world trade depression. If this starts overseas—as did the last one—there is little we can do to avoid it. Its effects can, at best, be mitigated by Government action, there being no other agency capable of the vast expenditure required. A depression starting here is unlikely to get very far, since the Government is committed to at least attempting to maintain full employment; but this will not help the aircraft industry very much if no one abroad can afford to buy their output, and in this respect the luxury nature of the product is likely to cause this particular import to be cut by foreigners very early in the game. Business men are in a hurry, and large numbers of people want to fly when trade is good, not when it is bad.

However, to revert to war production and the housing problem, the snag is that labour in general is very well aware



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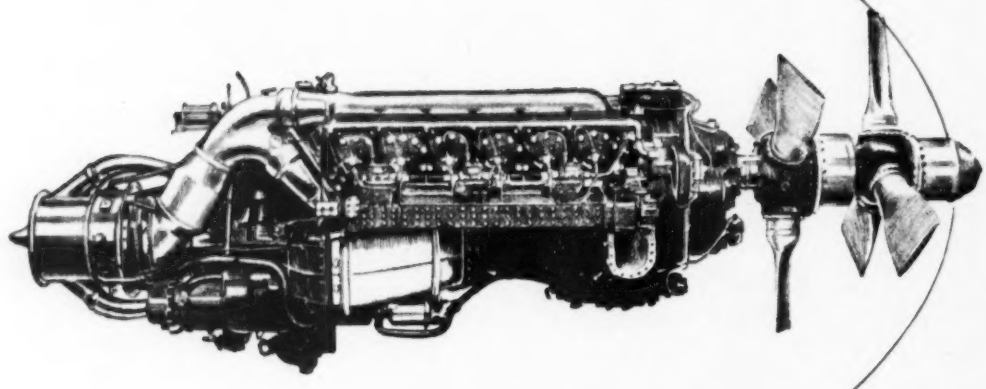

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THE MANPOWER BACKGROUND . . .

of the unstable nature of aircraft production, even if they are not able to analyse its causes and probable course. They know very well—particularly those trained personnel who became so suddenly redundant at the end of the war—that the jobs increase (apart from the secular trend of aviation expansion) only when there is a war or fear of war. If there is no more than a fear (and who dares to say war is inevitable?) they know that the jobs will soon be fewer. They can probably get other jobs elsewhere, of course, when demand falls off; but at what cost in time, trouble and family complications against the background of a housing shortage and high wages in softer jobs nearer home?

For this reason the notion of linking house-building with armament work (and aircraft production specifically) is doomed to failure. The purchase of a house is normally about the biggest piece of expenditure to which the average worker commits himself during his lifetime, and he is not likely to hang a millstone like that around his neck in connection with a job which he regards as inherently unstable. Such a notion might work if the houses were built by the aircraft firm and rented to its employees—assuming that it could get the permits and that its cost curves would stand the racket.

In short, the industry must stabilize itself and spread production of one sort or another—not necessarily of aircraft only—over the lean years as well as over the fat ones.

Foreign Labour?

At this point I would be in good company if I dashed off a solution in a line or two without considering its practicability, or if I threw the question back to the industry, as though they were not well aware of it already. The difficulties are enormous; but there are some possibilities which do not seem to have been adequately explored. For instance, to meet the immediate shortage there is in Italy and Germany a reservoir of skilled and semi-skilled labour, including aircraft workers, which is not at present employed—either on aircraft production or on anything else. If it is not attracted and permitted to work here it will very likely soon be employed to compete against our own hard-pressed industry, if not to rearm against-us, as happened once before. There are, of course, vast difficulties in the introduction of foreign labour, but the manpower is there and immigrant workers to Australia and the U.S.A. learn and adapt themselves quickly enough. Furthermore, a goodly proportion of these people are known to be ambitious for the relatively high standards and good working conditions of this country and would doubtless be willing to live in Nissen huts—which are better than caves or air-raid shelters. Is it quite out of the question to get them over here?

As regards the unstable market for its products, it might pay the industry to develop the possibilities of alternative products—English Electric make things other than aircraft and Hawker Siddeley make motor-cars and houses. While you cannot keep a permanent manpower reserve in those lines sufficient to meet the increased demand during a rearmament drive (any more than you can turn all your skilled aircraft technicians onto other products when the armaments drive falls through) it should not be difficult, given the will, to take the worst of the bite out of the trade cycle. Electricians, riveters, instrument mechanics, draughtsmen, ratefixers, will be much easier to come by and easier to keep if they know that they can turn to refrigerators and motor-cars when the bottom falls out of the aircraft market. Coupled with this, the industry, so long as it has no girlish aversion to Governmental planning and paternalism, might very reasonably ask for guarantees that orders of one kind or another will be forthcoming in a steady flow at some level which is calculated to attract and keep a useful skilled reserve in the industry at all times, notably during slumps.

Making Work

None of our leading politicians has yet been found to deny the Keynesian thesis that in a depression it is better for the economy to keep labour digging holes at the taxpayer's expense rather than have it standing in dole queues doing nothing. Under a full employment policy the Government is committed to expenditure to keep the country's manpower at work all the time and the factories and machines of the aircraft industry might well be the recipients of some of the orders. Rather have them producing household goods and those aircraft and power plants we need for cheaper club flying than have them stand idle while their skilled men sweep streets.

Without such a policy of stabilization, initiated by private enterprise (or with Government help if private enterprise is unable or unwilling) the industry is committed to continual swings from boom to depression and back again, coupled with the chronic alternatives of a shortage of manpower followed by a surplus. Stabilization of this unhappy situation will help to solve or eliminate the short-term problems of special armament drives or the variations of trade cycles.

For the immediate present I see no alternative to bidding labour away (if possible) from other industries, but there can be no choice as to which they should be. In addition, it might be possible to introduce foreign labour on short-term contracts. Many will leap to put pens to paper in protest that this is not the answer. They may be right, and let us all hope that someone has a better one; but let us have none of these facile "solutions" which ignore economic, political and psychological realities.

A DROP IN WAGES (concluded from page 128)

divided up for the labourers who gathered around. Bandits or not, they would get their pay.

We flew on again to the next drop, and by now I was feeling like an old hand, untying the rope and transferring the bag to my knees.

"There are a lot of trees around the next dropping zone," said Mr. Hamnett. "Got a good grip? There it is."

I leaned out and felt the wind whipping at clothes, hair and even eyelashes. The world tilted sideways and we were gliding in over the zone. There were the manager and the usual guards, and the expectant crowd of wage-earners gathered around below, all tilted backwards and foreshortened, so that they appeared to have stout chests and no legs. The children looked like midget adults in their sarongs and sarees.

"Get ready!" . . . "Drop!" . . . "Away!"

Once again the bag was safely picked up and escorted away to the rubber plantation's office.

It was only on the way home across the jungle that I asked how much money we had carried. "Oh, about a hundred thousand dollars," said the pilot. Sometimes it is less, sometimes much more, even up to a quarter of a million. Since then I have been out again as a dropper, and there is little point in knowing the amount of money beforehand, for the one and only responsibility is to hit the target.

Now, relaxing, one could look down on the jungle and imagine one saw fresh bandit tracks, newly broken-up camps and all sorts of sinister things. The pilots themselves become so familiar with the landmarks that their observations are of considerable assistance to the Powers-that-Be. Usually an Army officer asks permission to do the "dropping" so that he can observe for himself.

The trip home was glorious with sun and clouds reflected in mining pools below, the little aircraft sailed along like a leaf on the wind. Clouds beneath us took fantastic shapes, blowing smoke rings at us, or sailing along like the fairy-book pictures of the east wind bringing warm rain to pastures.

Then the airport appeared beneath us, and we turned and came in. The part I had played was only a minor one—that of doing as one was told—but I never cease to wonder at the skill of the pilots who set their compass and soar out every day to locate these little settlements in the hills—all of which look alike—to drop the sustenance of life to thousands of waiting workers.

CORRESPONDENCE

The Editor of "Flight" does not hold himself responsible for the views expressed by correspondents in these columns; the names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

Production and Manpower

REFERENCE "Pedantica's" letter (January 18th), I bow my head in shame for the error of simple arithmetic, although, as your correspondent says, the true figure of the value of the Comet is even more impressive than the one which was originally quoted.

I was not seriously suggesting (in my article "Challenge," January 4th) that the motor-car industry should be shut down in favour of aircraft construction, and indeed I agree with "Pedantica" that it is necessary for this country to get the best of both worlds. I was, however, seeking to show by my comparison that, potentially, building civil aircraft is as important as the "shop window" business in motor cars. There are undoubtedly many industries and occupations of much less value to the nation from which the necessary manpower could be obtained.

As an afterthought on the housing problem, one wonders how much sub-contract work could be hired out to areas where there are already workers and machine tools. It has, however, been explained to me that many skilled workers have left the industry proper in order to work in small engineering concerns at about the same basic rate of pay, but with the added attraction of a pound or two of cash handed quietly over as a bonus for a good week's work. This "bonus" is, of course, a strictly illegal and tax-free proceeding, and one does not easily see how a properly organized firm can compete with it. The first temptation is to harness these small engineering shops to the ever-all aviation effort by getting them in on sub-contract, but this perhaps completes a vicious circle, since they then attract even more workers away from the main industry by their offers of a pound or two more "under the counter." Income tax, of course, lies at the root of this matter, which could, perhaps, none the less be fully analysed to advantage.

London, W.1. CHARLES GARDNER.

YOUR correspondent "Once Bitten" has raised an interesting point in his letter of January 18th, and one which must surely have bedevilled the aircraft industry since its earliest days.

In the past so much of our aircraft production has been for military purposes, that of necessity it has been subject to the enormous expansion and contraction necessitated by wars and their passings, and by the policies of "peace-time" Governments between the wars. It has followed that many workers in the industry, outside the innermost circle of key personnel, have been found redundant after entering the industry on the crest of a rearmament wave.

It does, therefore, seem a pity that after the industry had settled down from the effects of the last spot of bother terminating in 1945, it could not have been allowed to expand steadily, and on the solid basis which our new commercial aircraft could have provided, without having to be disrupted by a rearmament programme which, we all hope, will one day end.

Experienced men get older, like other mortals, and cannot suffer too many "ins and outs" without either thinking furiously themselves or having their dependents put on the screw and cause another permanent defection from the ranks of the industry.

A parallel to the technician problem has surely arisen on the aircrew side. The rapid expansion of all kinds of air travel and transport immediately after the war attracted many hundreds of experienced crews to the business. Then came the doldrums of 1949, when charter operators faded from the scene one by one, and even the Corporations had periodic redundancies. Unfortunately, as a steadier type of business began to develop on the charter side, a false "boom" was created by the Berlin airlift which, once over, saw the return of many crews to the ranks of the unemployed.

My company hung on to the bitter end, but succumbed to the inevitable nearly eighteen months ago. Now it seems that there is a general cry for pilots and R/O.s as the Government distributes trooping contracts. When "peace" comes again, one can only assume the worst will follow, and in any case the private operator is eventually going to be up against fleet replacement.

Perranporth, Cornwall. AGRICOLA.

Complacency?

AT the end of your recent article on the history of the Hawker firm, I was pleasurably surprised to read that the P.1067 was probably the first fighter to fly faster than 700 m.p.h. in level flight. I made a few calculations; said to myself, "The British usually err on the conservative side"; and made out the critical Mach Number of that very nice-looking aircraft as about 0.95.

Comparing it with the Meteor 4 (0.78), Meteor 8 (0.82), Thunderjet (0.82) and Sabre (0.86), I thought that the 1067 showed real progress. You will imagine my surprise when, a few days ago, I read in a booklet published by Vickers that, just after the last war, a Spitfire 21 had been dived to 0.92. Incidentally, the reduction gear broke down twice in the course of the steep dives involved, and the pilot had to force-land as a consequence.

Surely then, if in 1951 the best that can be done with a modern airframe is only just better than what has been accomplished with an airframe the basic design of which is 17 years old, something must be very wrong with the methods of designing fighter aircraft.

Personally, I do not think that the designers are at fault, but rather the specifications drawn up by Air Ministry and most certainly the conservative views that prevented the realization of promising, if revolutionary, designs. The deltas and rocket propulsion should have been experimented with at least three years ago, not in the course of a rearmament programme, but as normal progress in fighter design. When and if the 1067 and Swift reach squadron service, they will be as obsolete as the Meteors are now, and that will mean a lot of wasted effort and most certainly wasted lives, should another conflict break out.

Another example of that happy complacency: the lack of official interest and support for the new explosion-suppression device described in one of your recent issues.

I hope you will forgive a foreigner for being so blunt, but "*qui aime bien, châtie bien!*"

St. Trond, Belgium. VERY INTERESTED.

[While welcoming this letter from an officer of the Belgian Air Force, we would point out that the author of the Sopwith/Hawker history did not state that the P.1067 was probably the first fighter to fly faster than 700 m.p.h., but that it might in due time add a "first over 700" to the honours of the Hawker family. This, we suggest, is a somewhat flimsy basis upon which to calculate a Mach number.—ED.]

Ultra-lights

IT is unusual to find articles devoted to ultra-light aircraft, and the interesting summary which appeared in your issue of December 28th calls for further comment. The writer is of the opinion that the present predicament of the "ultra-light" movement is mainly due to a scarcity of suitable types. Mr. Wheatley mentions support for the Chilton monoplane, for which the writer has unlimited enthusiasm. At the same time it is most regrettable that only four examples of this type are in airworthy condition, although it is almost certain that this was the number originally built. These are, to my best knowledge: G-AESZ, first prototype; G-AFSV, Train-engined version; G-AFGH, the whereabouts and condition of which remain a complete mystery; and, finally, G-AFGI, the *Daily Express* Race winner for 1951.

It is unfortunate that the present generation of private owners seem to prefer multi-seat light aircraft, the odd passenger being required for conversation purposes! The near future may find a few younger enthusiasts who prefer to be true solo types, and are not interested in showing their girl friends how well they can fly.

Coventry. TIGER BASHER.

CONTINUED interest in a power unit for ultra-light aircraft calls to mind a matter which may deserve discussion. The specific weight of air-cooled engines of 1,000 b.h.p. and over is about 1.1 lb/b.h.p., but, below this power, specific weights gradually rise to about 2.5 lb/b.h.p. in the smallest sizes. During the past four years, however, *The Aeromodeller* has published test results for 45 miniature engines of the single-cylinder two-stroke type. Some of the figures are truly remarkable. One racing engine produced 0.82 h.p. for a bare weight of 6.5 oz, which is equivalent to 0.5 lb/b.h.p.—better than many large gas turbines. Figures below 1.2 lb/b.h.p. are so common as to raise serious doubts as to the wisdom of employing four cylinders and complicated valve mechanisms on any small aircraft engines. A single-cylinder two-stroke engine of up to 1,000 c.c. capacity should be relatively cheap to develop, produce and maintain. Vibration may be a problem, but hardly more than in the case of motor cycles, while low weight should more than compensate for any inefficiency.

While the pen is to the paper, may I also suggest, as a matter of historical interest, that the Hurricane which usually leads the annual Battle of Britain fly-past should in future be accompanied by a Spitfire? I believe there is a Mk I in the Imperial War Museum, but it would be interesting to know if any are still flying.

Manchester, 19. G. R. BARRATT.

New Forest Airfield

IN your issue of January 18th Capt. Lamplugh challenges my statement that the New Forest Flying School aerodrome was where the present R.A.F. airfield of today is.

I think my recollection is as likely to be right as is that of "Lamps." In 1916 I flew at Beaulieu, an R.F.C. flying school, which took over the ground used by the N.F.F.S., and it is firmly in my memory as I had my first prang there when the Beardmore engine of an F.E.2b quit as I was taking off.

When I visited the present airfield two or three years ago, Allen Wheeler, who was then station commander, and the late "Jeep" Cable (who was stationed there) both told me that the old airfield formed a corner of the present one. The whole lie of the land has been altered by engulfment (a good bureaucratic word!) —the building of runways, hard-standings, perimeter tracks, hangars, and station buildings—and some old roads have been closed, diverted, or built over.

London, S.W.3. GEOFFREY DORMAN.

I CAN confirm Capt. Lamplugh's statement as to the location of the New Forest airfield. I was stationed there during the First World War; it is, in fact, just south of the village of East Boldre, and in the little churchyard of that village are the graves of those who were killed in training during that brisk and brutal era of flying.

Incidentally, this airfield was the scene of a typical administrative muddle. Until the end of the war it consisted of temporary wooden living quarters and hangars of corrugated iron, but shortly before the armistice, and when it was evident that the war was ending, a most magnificent series of permanent buildings, with underground petrol service, and brick living accommodation, was erected. On revisiting the spot three years later I found that the whole had fallen into ruin. It has since been completely removed, and it is, in fact, very difficult to locate its position.

I still possess a photograph of an Avro which managed to land on the top of East Boldre Post Office, its tailskid precariously fixed in the chimney. The pilot escaped ignominiously down a ladder!

Cowplain, Portsmouth. F. N. SCAIFE.

Aircraft-ferrying Facilities

WE have here at Croydon the nucleus of what could, in the event of war, be another A.T.A. We have a ferry pool consisting of half a dozen men who possess Private Pilots' Licences, and whose experience varies from 200 to 4,000 hours. The pool is capable of ferrying the following types of aircraft: Beaufighters, Mosquitos and Spitfires (all marks); Oxford and Anson variants; all light twins; and all single-engined light aircraft.

The services of these ferry pilots are available to all on an expenses-payment basis, and any organization requiring ferry pilots may care to write or telephone to Central Aeronautical Bureau, Ltd., Croydon Airport, Surrey (Croydon 3382).

In order that our services be kept up to date, jet flying experience is urgently required by our two senior pilots, and any company which can provide such experience would, naturally, have two additional jet pilots available for delivery services. In addition, experience is required on the latest military trainers.

In view of the acute shortage of pilots, it is felt that the C.F.G. Pilot Pool may be of service to the industry.

Croydon, Surrey. MICHAEL J. CONRY,
Chairman, Central Flying Group.

The Navy and Coastal Command

DOWNRIGHT assertion has ever been the Navy's method of argument. Say a thing convincingly and quite a lot of people will swallow it unquestioningly.

The plea by "Icarus" for the transfer of Coastal Command to the Navy, and the subsequent correspondence, have been most interesting.

He says that personnel, after a tour of duty in Coastal Command, are liable to be sent to Bomber Command. That is better than in the Navy, where air people are liable to be sent to sea or some station where no flying takes place. If Coastal Command plays a *major* role in sea power then the Navy must play a *minor* role; so why not transfer Naval Aviation back to the R.A.F.?

"Icarus" admits that Naval Aviation is not sufficiently experienced to take over Coastal Command on its own. Whether any R.A.F. personnel would be prepared to transfer to the Navy is a moot point. There would be no prospect of promotion unless they were prepared to go to sea to take a watchkeeper's certificate. And just imagine the erks dressed in the ridiculous uniform specially retained to give the lower deck an inferiority complex!

Incidentally, it would be strange if Coastal Command were prepared to go over to the Navy after the *Scharnhorst-Gneisenau* slander, when the Navy blamed Coastal Command for not coming out. On this occasion the Navy was going to show the world how the job should be done. Theirs was to be all the the glory.

Mr. W. N. Cumming's third point, in his letter published on December 21st, hits the nail right on the head. How many non-air officers have been given air appointments within the last five years? By non-air officers is meant not qualified, as either pilot or observer. Jobs for the boys?

In 1914-18 R.N.A.S. meant "Really Not A Sailor" and the outlook of My Lords Commissioner of Admiralty is the same today. Until the Admiralty institutes promotion examinations comparable to the A, B and C examinations of the other Services, along with a stiff examination to staff courses, no one will believe their intentions to be really serious.

London, S.W.11. SPINIFEX.

"MILKMAID'S" criticism of the analogy used by "Icarus" is itself mechanically unsound. True it is that a tripod will not wobble if one leg is lengthened, but it is stable only if the centre of gravity lies within the triangle formed by joining the three points where its feet rest on the supporting surface. Therefore you can *shorten* a leg as much as you like, but you cannot lengthen one beyond the point where the c.g. is directly over the line joining the other two without causing the stool not only to wobble but to fall on its side.

Cambridge. PEDANTICA.

An Earlier DC-7

IN the January 11th issue of *Flight* (p. 51) there is a reference to the "new type of Douglas transport, to be known as the DC-7." Are you aware that this designation was assigned by Douglas, as far back as 1942, to the U.S.A.F. C-74 Globemaster 1? I believe Douglas also assigned DC-8, and a name, "Mixmaster" to the U.S.A.F. XB-42 (formerly XA-42), an unconventional pusher monoplane powered by two Allison V-1710-125 piston engines, and fitted with contra-rotating airscrews. It was delivered to the U.S.A.F. in 1945, together with the XB-42A, which had auxiliary jets fitted.

Croydon, Surrey. J. M. N. HUDSON.

[Yes, we were aware of this earlier use of the designation DC-7. Its re-employment is evidence, once again, of the confusing methods sometimes employed by U.S. constructors.—ED.]

Those Phonetics

MAY I add my cry of horror to those already raised at the thought of the new phonetic alphabet? It seems but yesterday that we sadly discarded "Ack, Beer, Charlie, Don" in favour of this new Americanized thing, "Able, Baker, Charlie." And now the latter is regarded with nostalgic affection at the prospect of wrestling with this new piece of tomfoolery! I cannot think that economy in syllables was the aim of the inventors, or why Foxtrot and not just Fox?

In this age of internationalism and British eclipse it seems only natural that we should have to sacrifice our code to the needs of the tongues of others, but some consolation can be gained from the fact that at least some of our language is retained. I once heard a Frenchman using his own particular phonetic alphabet, in which I recall "Isidore" and Naomi." At least we have been spared that.

Even so, there will be some life-long rebels in our ranks who will continue to use their favourite words, and eventually we shall have a wonderful mixture which will persist, presumably, until the last "old-timer" has gone to his grave and a generation untainted by "Able, Baker, Charlie" has arisen.

Perranporth, Cornwall. G. A. PERROTT.

Old-timers' World Reunion

YOU will probably remember me, at least in your archives. In 1913 I was the first German aeronaut to fly from Berlin to London *via* Paris. Moreover, from 1926 I represented the interests of the de Havilland Aircraft Co. in Germany.

At present, I am president of the "Alter Adler" (Old Eagles), an association of the first pioneers of aeronautics in Germany—an organization similar to that which already exists in France.

According to the rules of that association (and also, at first, in our own organization) only those pilots are admitted who gained their F.A.I. certificate *before* August 1st, 1914.

The purpose of the "Alter Adler" is, among other objects, the exchange and maintenance of common recollections of the development of aeronautics. Founded in 1927, the association celebrates its silver jubilee this year. For this reason, and with the approval of the German Federal Travel Ministry, it is planned to hold, in Germany, the First International Reunion of World Pioneers of Aviation. Preliminary work has already been started.

So far as I am aware there is, unfortunately, no similar association in England to which I can address myself. I would, therefore, be very grateful for information as to where I could obtain a list of names and addresses of pioneers still living.

Bad Kissingen, Germany. ALFRED FRIEDRICH.

[We are putting our correspondent in touch with one who may be able to assist him. Meanwhile, for any reader who cares to supply information, Herr Friedrich's address is Bad Kissingen, Promenadstrasse 5d, Germany.—ED.]

CIVIL AVIATION

B.E.A.'s DIFFICULT YEAR

DESPITE the fact that, by its operations in the calendar year 1951, B.E.A. earned an extra £2 million of revenue with basically the same fleet as in the previous year, the higher costs of operating had the effect of increasing the deficit for this period by some £307,500. The total loss was £1,260,000. During the twelve months more than 1,100,000 passengers and a considerably larger quantity of freight were carried and in this respect the year can be considered one of achievement. The main reasons for the increase in deficit were detailed by the Corporation's chief executive, Mr. Peter Masefield, in a statement published last week.

Delays in the delivery of Elizabethans are said to have cost £400,000 in loss of revenue alone and there was also an increase in operating cost (about £30,000) as the result of having to fill-in planned Elizabethan services with smaller aircraft having a higher cost per seat-mile. The establishment of a traffic-handling station at Heathrow earlier than was required, the provision of maintenance-hangar accommodation, and the training of personnel, all for the Elizabethans, cost a further £110,000. B.E.A. has already expended some £2 million in capital on these aircraft in progress payments for their manufacture.

The delay in the Pionair conversion programme, now running about a year behind schedule, cost about £70,000 in loss of revenue. Wage increases and the general trend of rising costs accounted for a further £1,200,000; the "go-slow" strike in July, which resulted in the cancellation of 450 services at the peak of the summer season, cost about £150,000, while a further loss of £100,000 was attributed to the pilot shortage which limited peak revenue in the summer.

An extra and unforeseen item was the increased cost of about £110,000 reflected by the 730,000 miles of additional unproductive flying which resulted from the introduction of the M.C.A. Airways Plan in 1951. This had the effect of increasing the Corporation's route-mileage by 3.2 per cent to serve exactly the same points as before. Finally, the pre-Christmas fogs cost the Corporation about £30,000 in cancelled services.

The cumulative total of all these snags, bugbears and shortcomings amounted to approximately £1¼ million, which made all the difference between the achievement of a small but useful profit and the current loss of £1¼ million.

The Corporation will be able to face the future with greater confidence, however, in the knowledge that Elizabethan deliveries should begin within the next few weeks and that the Pionair conversion programme (involving a total of 38 machines) should be completed by June. With 132 pilots now under training B.E.A. hopes also to have enough crews to cope with peak services this summer. By this time next year, also, the Discovery class should be in service and it is hoped that this will bring about a substantial increase in traffic while at the same time reducing the cost of each seat-mile flown. B.E.A. is now making an all-out effort to reduce costs and increase revenue during the few remaining weeks of the financial year which ends on March 31st, so that with any luck the final result may not be as bad as was expected.

"NEWS" FROM AMERICA

ON receipt of a copy of our contemporary *Aviation Week* we turn with eager anticipation to the news paragraphs to see what may have been released exclusively on the other side of the Atlantic. This week we were astonished to read that "the 40 British Vickers Viscount turboprop airliners on order for B.E.A. will use 215-lb rocket assists for take-off in tropical climate and high altitudes" and that "the rocket motors use liquid oxygen and a mixture of water and methanol for propellant."

The columnist, "Industry Observer," seems to have allowed his eye to stray from the ball. The B.E.A. Viscount order is for 20, plus a few (the number has not yet been finalized), while there are a further twelve for Air France and four for Aer Lingus. Secondly, the Corporation serves no tropical or high-altitude fields and certainly no rocket assistance has ever been contemplated; the Viscount's Dart turboprops are equipped for water-methanol injection to restore take-off power if and when necessary. Incidentally, we hear that the first production machine is coming on well, and will fly this summer.

We are now wondering whether 40 of some other aircraft might have been ordered for some other operator and, if so, whether they will need rocket assistance at take-off.

There is a second paragraph in the column which we would like to believe; it states that Tasman Empire Airways have ordered a number of Bristol 175s with deliveries scheduled for 1955. This, we are assured, is not so. It is true that the 175 is probably the best aircraft for this New Zealand operator, but unless Bristols can guarantee delivery dates—and at the time of writing they cannot—there can be no order, much as the two parties might like to see one signed. Fortunately the prospects of some delivery arrangement being made are considered good.

Finally, regarding a third paragraph, we in Britain are not permitted to comment upon the suggestion that A.V. Roe Canada have been working upon a transonic delta fighter for about a year; but it is certainly the first we have heard of it.

NUMBER ONE: The first production model of the Convairliner 340, destined for United Airlines, is seen at the Santiago (California) plant of Consolidated Vultee ready to embark upon its flight-test programme. This aircraft, the first of 40 which United has on order, is scheduled for delivery in March. The cruising speed of the 340 is about 300 m.p.h. and it has seating capacity for 44 passengers.

CHIEF EXECUTIVE THINKS ALOUD

WHEN—for the benefit of interested Americans—Mr. Peter Masefield explained in a recent interview with a U.S. journalist the British viewpoint on current development in the sphere of air transport, he also disclosed several interesting sidelights on B.E.A.'s experience with helicopter operations and on the Corporation's plans for the future generally. Commenting, for example, on the relationship between revenue and cost on the helicopter scheduled-service experiments, he said that revenue had amounted to only about 5 per cent of the expenditure. A special experimental grant from the M.C.A. and the Ministry of Supply was used to cover a proportion of the operating costs. Last year's grant amounted to about £80,000 and the total amount of flying to about 1,850 hr. Mr. Masefield told his interviewer (whose report has since been published in *American Aviation*) that operations to date had proved the need for specialized navigational and traffic-control equipment for helicopters. B.E.A.'s view was that, regardless of what was the eventual answer to the precise navigational aid for fixed-wing aircraft, the Decca system was right for the helicopter, because it was accurate down to ground level. A helicopter pilot could thus fly in on Decca underneath the ordinary traffic pattern.

The most critical test facing the helicopter at the moment, he continued, was the establishment of satisfactory stability, control and one-engine-out performance combined with an adequate overhaul life for the various moving parts.

On the subject of B.E.A.'s operations with the turboprop Discovery-class aircraft, Mr. Masefield expressed the opinion that the minimum economic flight-leg for machines of this type was about 400 miles. Nevetheless, they could be used on the London-Paris route, though not quite as cheaply as the Elizabethans unless the volumetric capacity of the Viscount's fuselage were increased. [This will probably be done on later versions of the Viscount.] Mr. Masefield thought that on a route such as London-Paris a break-even load-factor of 60-64 per cent would be adequate for Discovery services at presently contemplated fares. He also mentioned that B.E.A. were planning to overhaul their own Dart turboprops and to that end were pursuing—in company with Rolls-Royce—an investigation into the economics of the idea.

HERON ALOFT: This new photograph of the prototype D.H. Heron lends interest to the news, published below, of the final performance details for the production aircraft, the first of which is now nearing completion at Hatfield.

Speaking of the world air-transport situation in general, Mr. Masefield said he thought the major mistake which airlines had made in the post-war period was in not "thinking big enough." If operators had thought in terms of more and larger aircraft earlier we should be much better off today. There would be no difficulty in operating, for example, 65/70-passenger types on short-haul services instead of the 40/50-passenger machines which are now coming into service.

B.E.A.'s particular need was for an aircraft which, although not as large as the DC-6B or Super-Constellation, would yet have as great a passenger-capacity over medium stages. He thought that a cardinal mistake had been made by the world's airlines in failing to agree on a suitable replacement for the DC-3 in the immediate post-war years.

HERON PERFORMANCE DETAILS

NOW that the first production de Havilland Heron is nearing completion at Hatfield, the manufacturers have released complete details of the measured performance of this 14/17-seat feederliner. The good results obtained during trials have enabled the Heron to be certified in both Groups "A" and "C" of British Civil Airworthiness Requirements, the former ensuring compliance with I.C.A.O. Transport Category "A" recommendations. The main figures (measured under International Standard Atmosphere conditions) for the Heron at an all-up weight of 12,500 lb are as follows:—

TAKE-OFF:—	
Distance to 50 ft in still air (sea level), from a hard runway, flaps at 20 deg:—	
With all engines operating	685 yd (625 m)
With failure of critical engine at safety speed ...	780 yd (715 m)
Distance to safety speed	495 yd (455 m)
Accelerate-stop distance if one engine fails at safety speed	1,090 yd (1,000 m)
Take-off safety speed (E.A.S.)...	91 m.p.h. (146.5 km/hr)
CLIMB:—	
Rate of climb (sea-level) take-off power, flaps at 20 deg:—	
With all engines operating	940 ft/min (4.78 m/sec)
With critical engine inoperative and its airscrew windmilling in fine pitch	400 ft/min (2.03 m/sec)
En-route rate of climb (sea level), max. cont. power, flaps up:—	
With all engines operating	1,125 ft/min (5.71 m/sec)
With critical engine inoperative and its airscrew windmilling in coarse pitch	955 ft min (3.03 m/sec)
CRUISE:—	
At 65 per cent M.E.T.O. power at 8,000 ft (2,440 m):—	
r.p.m.	2,100 (2,100)
True air speed	165 m.p.h. (266 km/hr)
Fuel consumption	42 galls/hr (191 l/hr)
	3.92 miles/gal (1.39 km/litre)
LANDING:—	
Distance from 50 ft., 15.3 m., in still air (sea level, on to a hard runway, flaps 60 deg, final approach at 1.3 x stalling speed)	665 yd (610 m)
STALLING SPEED (E.A.S.):—	
With flaps up	89 m.p.h. (143 km/hr)
With flaps at 20 deg (take-off)	79 m.p.h. (127 km/hr)
With flaps at 60 deg (landing)	71 m.p.h. (115 km/hr)

A retractable-undercarriage version of the Heron, the Series II, is also under development, but, until flight trials have been completed, de Havillands are unwilling to issue any detailed statement about its performance. Preliminary calculations, however, have shown that the fitting of a retractable undercarriage will probably raise the recommended cruising speed by some 15 to 20 m.p.h. at the expense of an increase of 110 lb in the tare weight.

The Series II will naturally show up to its best advantage on the longer stages. On stage-lengths exceeding 250 miles, for example, the saving in fuel due to the increase in air-miles per gallon from 3.92 to nearly 4.5 will more than balance the extra weight of the retractable undercarriage. For a stage-length of 700 miles the payload will be increased by 115 miles, the stage-time reduced by some 25 min and the cost per ton-mile reduced from 40 to 35 pence. The maximum stage-length with full long-range tanks will also be increased by some 125 miles to 975 miles, under I.F.R. conditions.

SILVER CITY FARE-REDUCTIONS

FOR the fourth successive year Silver City Airways have reduced the fares on their car-ferry services across the English Channel. New rates include reductions of up to 20 per cent on the 47-mile Lympne to Le Touquet flight and comparable rates on the new 92-mile Southampton-Cherbourg route. This year it will be possible to fly an Austin Seven or an M.G. from Lympne to Le Touquet for £12 single, as compared with £16 a year ago. For an 18ft car the fare is £24. Although the Southampton-Cherbourg route is nearly twice as long as the Le Touquet link, the car fares will be only £3 more in each category. The main reason for this comparatively slight difference is that the heaviest operating expenses are the landing fees and the fuel cost of take-offs at full power.

Because of the I.A.T.A.-controlled passenger-rate increase of about 6 per cent, and also by reason of new French landing taxes, passenger fares on the Lympne to Le Touquet service have had to be raised from £2 to £2 5s. The Cherbourg fare is to be £3 15s.

Silver City believes that there will be increased ferry traffic among cyclists and motorists this year and the company is trying to encourage travellers to fly both ways. To attract a greater share of the cyclist traffic Silver City has also arranged tours to the invasion beaches between Le Touquet and Cherbourg. A bicycle can be flown for as little as £1 to Le Touquet or for 25s to Cherbourg. The one-way charges for motorcycles on these two routes are £4 and £5 respectively.

Subject to authorization being granted by the M.C.A., the new service between Southend and Ostend will begin—in time for the Easter traffic—on or about April 10th.

BRITANNIA TROPHY AWARD

THE Royal Aero Club announces that its Committee has awarded the Britannia Challenge Trophy for 1951 to Capt. O. P. Jones, C.V.O., O.B.E., senior pilot of B.O.A.C. The award marks the completion of Capt. Jones's 30 years as an airline captain, during which time he has flown nearly 20,000 hr (involving more than three million aircraft-miles) and has carried over 126,000 passengers. This magnificent record had its culmination last year when he was selected to command the aircraft in which their Royal Highnesses Princess Elizabeth and the Duke of Edinburgh flew from London to Montreal.

Capt. Jones is 53 years old. He first learned to fly in 1917, and after the 1914-18 War he toured the United Kingdom joy-riding, and gave 12,000 passengers their first experience in the air. In 1922 he joined Instone Airlines and was a founder pilot of Imperial Airways and, later, of B.O.A.C.

The Britannia Challenge Trophy was presented to the Royal Aero Club in 1913 by Mr. Horatio Barber to be awarded to the British aviator, who, in the opinion of the Club Committee accomplishes the most meritorious performance in the air during the year.

CIVIL AVIATION . . .

CAR-CONTAINER: This picture of one of Silver City's Airways' Bristol Freighters was secured during a recent cross-Channel flight. Further reference to these ferry services is made on the preceding page.

BREVITIES

ENGAGED on a proving flight to South Africa, the D.H. Comet on loan to B.O.A.C. arrived at Johannesburg on January 23rd; it had previously been forced to return to Entebbe on January 19th because of engine trouble, which necessitated flying out spares from England. The aircraft was due to visit Livingstone Airport before returning to London.

* * *

An American accessory manufacturer, the Scott Aviation Corporation, has produced a compact set of oxygen equipment for aircraft of the small private-owner type. Known as the Aviox, it is designed in the shape of a suitcase for easy portability, weighs only 29 lb and provides a 2½-hr supply for four people.

* * *

T.W.A. has announced the appointment of Mr. Glen Craydon to the position of London district sales manager. His appointment releases Mr. Charles L. Yates, who will be returning to the United States.

* * *

The M.C.A. has appointed Mr. S. L. Hulme, O.B.E., to be Northern Divisional Controller at the Ministry's Liverpool headquarters. He succeeds Capt. B. L. Huskisson, D.S.C., who now becomes chairman of the Air Traffic Control Development staff at Ariel House.

* * *

S.A.S. is hoping to fly one of its new DC-6Bs this year from Santa Monica to Stockholm, *via* Edmonton and Greenland. The company is considering the idea of regular services between the West Coast of the United States by a Polar route, and may eventually fly to Tokyo on a similar routeing.

* * *

SWISS-MADE: A locally developed power-driven conveyer is now used by Swissair for loading and unloading aircraft at Kloten, Zurich. As this photograph shows, the loader can handle items of considerable bulk.

Some idea of the diversity of loads now being carried by freighters of A.N.A. can be obtained from this extract from one week's load-sheets: "Six tractors, 1,200 sprigs of heather, a 5-ton truck, 32 pigs . . ." In Australia the growth of air-cargo traffic is proving particularly rapid, while the airliner as a means of public transport has achieved notable popularity with all sections of the community.

* * *

The Mexican national airline, Compania Mexicana Aviacion, is yet another of the world's airlines to have reported a striking increase in traffic on last year's operations. C.M.A. handled more than 410,000 passengers and over 21,000,000 kg of freight. Aircraft kilometres flown, about 18,000,000, represented a total of 64,056 flying hours.

* * *

With seasonal traffic in the Caribbean area nearing its peak, British West Indian Airways, a subsidiary of B.O.A.C., have stepped-up the frequency of their services on two routes. The first, increased from once to twice weekly, is that between San Juan (Puerto Rico) and Trinidad, *via* Antigua and Barbados. Secondly, an extra flight each fortnight has been added to the existing weekly service between Kingston and San Juan. B.W.I.A. now operate to some 15 island points in the Caribbean and to three centres on the Central and South American mainland.

* * *

The "pre-clearance" process which has been adopted by Canada and the U.S. to ease border-crossing formalities for airline passengers has been hailed by I.C.A.O. and I.A.T.A. as an outstanding example of the way in which co-operation between governments can shorten time-consuming red-tape on international flights. Under the new procedure passengers from Canada to the U.S. are cleared for American Customs and immigration before embarking at Toronto. The American Government hopes shortly to introduce a reciprocal process at other Canadian and Mexican border points. I.A.T.A. is urging that a similar system should be instituted at such major traffic centres as London and Paris.

* * *

In a recently published report on tourist traffic to this country in 1951 the chairman of the British Travel and Holidays Association disclosed that a record proportion (31 per cent) of our foreign visitors arrived by air. The proportion of American visitors travelling in this way (42 per cent) was also a record. The introduction of excursion fares is said to have proved a popular and travel-stimulating measure. The total dollar earnings from North

American visitors using both air and surface transport amounted to $100,000,000. An American or Dominion visitor travelling to this country by a British-owned ship or aircraft is said to be worth just as much to Britain in foreign currency as the export value of the average British car sold abroad.

* * *

Recent protests by residents living near London Airport are recalled by the news that a demonstration of aircraft noise-suppression was held at Idlewild Airport, New York, last week. Two C-46 Commando transports were used, but only one had the silencing equipment fitted. The aircraft flew past at 500 and then 800ft, while recordings were made in nearby houses. Upon analysing the recordings, the sound reduction was found to be "about 50 per cent . . . particularly with the most irritating low frequencies." The apparatus consists of a double-walled cylindrical muffler, 4ft long, the inner wall being perforated and the interwall cavity being filled with steel wool. The effect of all this upon weight exhaust back-pressure, and aircraft performance, is not stated in reports so far received.

FLASHBACK to the THIRTIES

Vintage Aeroplane Club's First Rally

Much-admired Moth: One of the more recently enrolled member-aircraft of the V.A.C., this D.H.60—the oldest machine on the current civil register—attracted considerable attention.

AT Denham airfield during the week-end of January 19th-20th, the recently formed vintage Aeroplane Club successfully staged its first rally. The meeting, which was made possible by the co-operation of Dr. J. Myles Bickerton, the owner of the airfield, was attended by some 200 members and their friends. The weather at first seemed disinclined to share the spirit of things, but after some hesitation it finally decided to play a not over-generous part in making the day a success.

Amongst the large and varied display of vintage types arrayed outside the clubhouse were a D.H. 60 Moth, a Puss Moth, Hawker Hart, Hawker Tomtit, B.A. Swallow, two Aeroncas, three Tipsies and a Miles Whitney Straight. Vintage cars, also, were in evidence, and the general scene could well have been that of any flying meeting in the early thirties.

Aside from the organized flying programme, an unusual, novel diversion was a first flight made by an 80-year-old passenger, Miss Bryant. She enjoyed a trip with Beverley Snook in his Aeronca 100—an experience which, in view of the high wind, might well have been accepted with far less enthusiasm by hardened joy-riders.

Immediately after lunch the programme got under way, beginning with a spot-landing competition (throttles closed at 1,500ft and three attempts allowed); it was won by W/C. C. A. Pike, in the Cirrus Moth G-EBLV from Panshanger. Second and third place in this event went to P. J. Colbourne (Aeronca) and H. G. Davies (Tipsy) respectively.

At this stage F/L. A. W. Bedford, who has recently left the R.A.F. to join Hawkers as a test pilot and who is well known as a gliding enthusiast, took off in the famous Hawker Hart G-ABMR, to carry out a number of high-speed runs to the accompaniment of the Kestrels' healthy and characteristic roar.

Douglas Bianchi's three-litre Lagonda was then driven into the middle of the field to form the target for a bombing competition, and the competitors took off to aim their flour-bag "bombs" at its massive bonnet. It was soon apparent that none of those taking part in this event could have served as a bomb-aimer during the war; nevertheless, aggregates of three runs resulted in P. J. Colbourne (Aeronca) winning with a mean error of only 5.5 yd.

A polished display of aerobatics by C. A. Nepean Bishop, in a Miles Hawk Trainer owned by the Denham Flying Club, was followed by a slow-flying race. The gusty wind understandably deterred entrants, but three enthusiasts did manage to take off, the slowest staggerer proving to be R. Leeves in a Pobjoy-powered Swallow, G-AFCL.

S/L. Neville Duke then took off in the Hawker Tomtit, G-AFTA, for an exciting session of aerobatics before the final competition, an obstacle race, took place. A strictly non-flying item, this was divided into two classes, one for Aeroncas and one for Tipsies, the winners being Beverley Snook and H. G. Davies respectively.

A vintage fly-past concluded the flying for the day and members and their friends then repaired to the lounge where, after tea, S/L. J. C. C. Taylor, gave a talk on his flying experiences during the early part of the century, and on the early days of A. V. Roe and Co., Ltd., for whom he worked as a youth. The prizes, in the form of certificates, were next presented, followed by a film show, the emphasis once again being placed on vintage types.

Early Sunday morning saw members braving the elements once again (the wind had by this time subsided, although the temperature was still unpleasantly low) and, although no actual flying programme had been arranged, owners took the opportunity of flying one anothers' machines until daylight ran out.

Work has already started on the plans for the next rally, which it is hoped to hold at White Waltham on May 6th. The success of the inaugural event clearly proves that the love of the old "string-bags" has not died, and that in this supersonic age most of us have a very warm place in our hearts for these worthy veterans.

(Left) Beverley Snook's Aeronca, which took an 80-year-old lady passenger for her first flight. (Below, left) Powered by a Pobjoy Cataract III, this B.A. Swallow won the slow-flying competition. (Below, right) From Cardiff came this smart little Tipsy Trainer, piloted by H. G. Davies. The Hawker Tomtit is visible in the background.

SERVICE AVIATION

Royal Air Force and Naval Aviation News

AUSTRALIAN AIR BOARD: Air Marshal Hardman, the new C.A.S. of the R.A.A.F., at his first meeting with the Air Board. The members of the Board, left to right, are:— Mr. J. N. A. Andrews, Acting Finance Member; A. V-M. F. M. Bladin, Air Member for Personnel; A. V-M. J. E. Hewitt, Air Member for Supply and Equipment; Air Marshal G. Jones, retiring C.A.S.; Air Marshal J. D. I. Hardman; Mr. F. Mulrooney, Secretary; Mr. E. Hicks, the new Secretary of Department of Air; A. V-M. F. C. Wackett, Air Member for Technical Services; G/C. J. Waddy, Citizen Air Force Member.

Queen Presents New Badge

AFTER seeing Princess Elizabeth and the Duke of Edinburgh off on their tour of Australia and New Zealand yesterday, the Queen was to visit No. 600 Squadron, R.Aux.A.F., of which she is the Honorary Air Commodore, to present the unit with a new squadron badge.

The new badge will incorporate the arms of the City of London and will be used in addition to the present badge which, with a sword and moon *motif*, illustrates the squadron's night-fighting role during the war. Thus No. 600 will be the only unit to hold the distinction of having two official badges.

Air Equerries for Royal Tour

TWO wing commanders have been appointed extra air equerries for the Australian and New Zealand tour by Princess Elizabeth and the Duke of Edinburgh. In Australia W/C. M. G. Cowan, D.S.O., R.A.A.F., Director of Postings, has been chosen and W/C. D. F. St. George, D.F.C., R.N.Z.A.F., will act while the Royal couple are in New Zealand.

Appointments

IT has been announced by the Air Ministry that A. V-M. R. L. Ragg, C.B., C.B.E., A.F.C., who for the past two years has been S.A.S.O. at H.Q. F.E.A.F. is to be Director General of Personnel (2). The present D.G.P., A. V-M. T. C. Traill, C.B., O.B.E., D.F.C., is to command No. 19 Group, Coastal Command.

Another appointment from the Far East Air Force is that of A. Cdre. F. E. Lipscomb, Principal Medical Officer, to be one of the two new Honorary Physicians to the King. The other medical officer to be so honoured is A. Cdre. R. H. Stanbridge, the Principal Medical Officer of Bomber Command.

Two recent appointments in the W.R.A.F. are for G/Off. A. M. Muir to be W.R.A.F. Staff Officer, Technical Training Command and W/Off. E. M. Pitter, O.B.E., to be W.R.A.F. Staff Officer at H.Q. 2nd T.A.F. W/Off. Pitter will have the acting rank of Group Officer.

New Air Attaché for Paris

AFTER having been an air attaché for a longer period than any other R.A.F officer, A. V-M. R. A. George is retiring from his post in Paris. He will be succeeded by A. Cdre. J. G. Elton who, until recently, was the Commandant of No. 1 School of Technical Training, Halton.

A.O.C. Delivers Meteor 10

THE intention of A. V-M. David Atcherley to fly out to the Canal Zone when he took over command of No. 205 Group was referred to in *Flight* January 18th. He took off from Abingdon, Berks, and flew via Istre (Marseilles), El Aouina (Tunis), Castel Benito (Tripoli) and El Adem (Libya) arriving at Fayid on January 24th. The Meteor which he flew was one of two long-range P.R.10s for delivery to Egypt. The other was flown out at the same time by S/L. T. Stevenson.

R.N.V.R. Flying Times

OF all the R.N.V.R. air squadrons, the unit to achieve the greatest number of flying hours in 1951 was No. 1832 Fighter Squadron, which is stationed at Culham, Oxford. They put in some 2,893 hours while the runners-up, No. 1831, had a total of 2,141 hours. No. 1840 totalled 1,757 hours, No. 1830 1,625 hours and No. 1833 1,527 hours.

R.A.F.A. Membership

NEARLY 20,000 new members were enrolled in the R.A.F.A. during 1951. In the 53 overseas branches there was an over-all increase of 17 per cent but the lapsed membership in Great Britain is still a cause for anxiety. A welcome windfall for the association's funds was a cheque for £1,000 from the Society of British Aircraft Constructors, presented by the society because the S.B.A.C. Display and the Battle of Britain Week coincided last September.

More Forces for Canal Zone

REPORTS from Nicosia, Cyprus, state that the Third Division, stationed on the island, will go to the Canal Zone. The Scots Guards have already left by air in Hastings of Transport Command. No. 32 Squadron has also departed for Egypt. The light fleet carrier *Ocean* was due to dock at Famagusta from Malta on January 29th.

R.A.F. Regt. Ten Years Old

THE Royal Air Force Regiment is ten years old today, having come into being as an airfield protection corps on February 1st, 1942. Its rifle, armoured car and light anti-aircraft squadrons served with distinction in all theatres of the last war—at times fighting in the front line with the Army. In recognition of the regiment's excellent record, the King became its Air Commodore-in-Chief in 1947.

To mark the occasion, ceremonial parades are being held at all of the Regiment's depots and establishments. At Catterick, Yorkshire, the salute will be taken by A. V-M. S. C. Strafford, Commandant-General of the Regiment.

To Command "Vengeance"

THE admiralty has appointed Capt. H. C. N. Rolfe, R.N., to command the light carrier H.M.S. *Vengeance*, which is ferrying stores, aircraft and personnel to the Far East.

As far as Malta the ship will have on board about 100 ground crews for No. 809 R.N. Air Squadron. This unit, commanded by Lt. Cdr. D. H. Richards, R.N., is an all-weather fighter squadron, flying two-seater Sea Hornets. It is to fly out to Malta and will be based on the island for a few months.

A.T.C. Flying Badge

AIR TRAINING CORPS cadets who qualify for their Private Pilot's Licences under the Air Ministry flying scholarships scheme are to receive a specially designed flying badge.

During the next two or three weeks

SPRING CRUISE: The carrier H.M.S. "Indomitable" shortly after leaving Portland Harbour at the start of the Home Fleet's spring cruise, during which combined exercises will be held with the Mediterranean Fleet.

SERVICE AVIATION . . .

A.T.C. squadron parades will be held throughout the country, when approximately 300 cadets who have so far qualified will be presented with their badges. About 100 squadrons have members who have qualified.

The official description of the badge is: "A bird with outstretched wings, in gilt, on a background of R.A.F. blue enamel, surrounded by oak leaves in gilt." It is to be worn in a central position on the left-hand breast pocket of the jacket below the flap.

R.Aux.A.F. Inspector

SERVING in a part-time capacity, G/C. J. M. Birkin, D.S.O., O.B.E., D.F.C., A.F.C., is to be the new Inspector of the R.Aux.A.F. in succession to A. Cdre. Finlay Crerar, C.B.E. G/C. Birkin commanded No. 504 (County of Nottingham) Squadron, R.Aux.A.F., from 1948 to 1950. He is the Air Force member of the T.A.F.A. for Nottingham County.

Bomber Command Essay Prize-winners

ALL R.A.F. and W.R.A.F. officers in Bomber Command below the rank of wing commander or wing officer (with the exception of medical and dental officers) were required to write essays last year on two out of three selected subjects, and airmen aircrew were required to write one. Essays were limited to 2,000 words and a prize has been awarded by the A.O.C.-in-C., Air Marshal Sir Hugh Pughe Lloyd, for the best essay on each subject.

One subject, which was compulsory for officers at Group Headquarters and for officers and aircrew at bomber stations, was: "The bomber is a rapier and not a bludgeon. Discuss the implications of this statement." The winning essay was submitted by F/L. J. Crane, of R.A.F. station Upwood.

All officers in the Command were required to write an essay discussing this problem: "With the growing complexity of modern aircraft and equipment it is stated that it is becoming increasingly difficult to avoid specialisation and a high degree of skill and training. To what extent is it possible to overcome this by replacement of parts as opposed to repair and rectification?" The prizewinner was F/L. E. H. White, stationed at Marham.

The other essay concerned photographic reconnaissance. On this subject the judges had to decide between S/L. J. G. Bishop, D.F.C. (Benson), who was finally adjudged the winner, and F/L. J. H. Hall (Nuneham Park).

DOUBLING UP: All aircrew of the Royal Canadian Air Force are in future to wear double wings in place of the usual single-wing badge. Above is shown the flight engineers' insignia.

Communications Appointment

THE appointment is announced of A. Cdre. W. P. G. Pretty, C.B.E., as Director of Communications Development to the Ministry of Supply. A. Cdre. Pretty became Deputy Director of Radar at the Air Ministry in 1942. Since then he has held a number of signals appointments and was, in 1948, Director-General of Navigational Services.

Special Award for No. 1832 Squadron

AN award of £20 from the Lott Naval Trust Fund has been made to No. 1832 R.N.V.R. Squadron, based at R.N. Air Station Culham, for their "quality of work, airmanship, freedom from accidents, flying intensity and maintenance standards." A close runner-up was No. 1840 Squadron.

The Lott Naval Trust Fund was established in 1928 through the generosity of the late Mr. Herbert Lott, of Wallingford (Berks), a former member of the London Stock Exchange, who, in a will made in 1906, bequeathed a large proportion of his money for the improvement of efficiency of gunnery in the Royal Navy. In 1928 he decided to start the work during his lifetime and that its scope should be enlarged. He made an initial payment of £25,000 and when he died in 1947 the Fund benefited by a further £133,000.

COCKPIT CONSIDERATION: G/C. Z. L. Leigh, Chief Staff Officer, and S/L. J. A. Anderson, Training Officer, from the Canadian Air Training Command, inspect the Comet's cockpit layout at Hatfield. The R.C.A.F. has ordered two Comets.

Half-yearly Promotions

THE following names complete the list of half-yearly promotions recently announced by the Air Ministry.

From Flight Lieutenant to Squadron Leader.—A. F. Osborne, D.F.C.; J. E. Tipton, D.F.C.; P. C. Ellis, D.F.C.; I. D. Bolton, D.F.C.; W. C. Sinclair, A.F.C.; J. E. Kilduff; D. J. Furner, D.F.C.; W. S. Close, D.F.C.; J. L. Causton, D.F.C.; V. S. Swain, D.F.C.; R. P. James; R. G. West, D.F.C.; R. G. Price, D.F.C.; B. P. Mugford; A. R. Scott, D.F.C.; K. R. Bowhill; J. T. Hitching, A.F.C.; J. H. Gaston; J. T. Ormston; G. E. Jones; I. Macdonald, A.F.C.; J. A. W. Long, A.F.C.; I. F. Potter, D.F.C.; J. Care, D.F.C.; V. A. Pengilley; L. L. Harland, D.F.C.; J. S. Millington, D.F.C.; M. H. Exton, D.F.C.; J. R. Forsythe, D.F.C.; W. J. Ives; P. W. Edmonds. I. C. Blair, D.F.C., A.F.C.; S. C. Dunmore; R. S. Sanders, D.F.C.; G. Hampton, D.F.C.; J. G. Harrison; M. G. Crotty, D.F.C.; G. C. Lamb, A.F.C.; G. W. Buckland, D.F.C.; R. T. Bowring, A.F.C.; R. Le Cudenec, D.F.C.; M. J. Beetham, D.F.C.; E. W. Merriman, M.B.E., D.F.M.; C. H. Loder (Sen. 1st July, 1951); G. Medd; W. T. Dunlop; F. W. Pritchard; C. W. Layton, M.B.E.; E. W. Cotton; R. A. Prew; G. C. Tayler; J. C. K. Sutton; G. W. T. Hossent; W. R. J. Marriott; J. J. Cradden; F. T. Bolt; W. F. Adams; N. G. O'Brien, M.B.E.; D. S. Gregory, D.F.M.; C. J. Boalch; J. F. Ratcliffe; A. H. Jane, M.B.E.; J. E. Lewis; W. C. Horder; H. G. A. Scilley, A.F.R.Ae.S.; F. G. B. Randall; S. A. Fentum; A. J. Flake; R. J. Palmer, M.B.E.; F. G. Abbott; R. Jones; R. C. Hazell; M. Le M. Manson; R. E. G. Piff; H. W. Busen-Schmitz, A.F.R.Ae.S.; R. E. Gilks; H. Fincher; R. W. White; F. Cotterill, B.Sc.; G. V. Cowmeadow, B.Sc.; J. T. Adey, B.Sc., A.F.R.Ae.S.; M. D. Logan, B.A.; T. A. J. Stocker, M.B.E., B.Sc.; R. H. Warr; V. J. Chapman; H. S. Gibson; P. J. Maddaford; R. C. S. Bevan; T. H. Martin; J. W. Judge; A. C. Pressman; V. T. Land; P. P. G. Smith; P. C. A. Rich; W. G. Maxwell; A. J. Elliott, O.B.E.; W. Gallagher, M.V.O., A.F.C.; W. Meekin; T. Jones; C. B. M. Shevlin, D.F.C., D.F.M.; J. G. Ireton; W. L. Barg, D.F.C.; A. A. Storar; F. Jackson; F. S. R. Johnson; H. L. Tucker; L. B. Davey; W. A. Pattison; F. R. Graeme-Evans; R. R. P. Fisher; R. M. H. Ross; C. Midwinter, A.F.M.; R. C. J. Waters; K. Schadtler-Law; W. P. Hokpin, D.F.C.; B. L. Davis; J. P. Date; J. G. McKeown; W. E. McChesney; V. K. Chancellor; F. H. A. Camp, M.B.E.; E. J. Wilson; N. E. Wheeler; I. G. Best; A. F. Simmons; R. D. Frost; D. Field; F. W. J. Kemp; H. Street; J. A. Ellice; A. R. Walker; B. Brooke; D. A. Bliss; G. R. Hessey; E. C. Heath; P. H. P. Milton; W. J. H. Witchell; C. N. Cobb, M.B.E.; G. E. S. Bumstead; D. G. Roberts, M.M.; R. F. Duncombe; A. Cruickshank; R. P. Hogg; O. A. Ward; W. L. Hitchcock; F. A. Hall, M.C.; F. M. Biddulph, A.F.C.; A. E. Forgeard; R. Thompson, D.F.C.; G. M. I. Tweedie; L. A. Parr (Sen. 1st July, 1951); H. H. A. Ironside; J. Shearsmith, A.F.C., A.F.M.; J. B. Robertson, M.B.E., D.F.M.; A. J. Morgan, A.F.C.; H. F. G. Dainty; K. C. C. Hicks; G. F. McMahon, D.F.M.; L. W. C. Lewis; J. R. C. Proudlock; H. Taswell; A. A. Witherington.

Flight Officer to Squadron Officer, W.R.A.F.—M. E. Hemelryk; M. J. Paddock; P. J. Copinger; M. F. Goodworth; H. David, M.B.E.; M. E. M. Riddell; Y. M. Carr; S. Harding.

Flying Officer to Flight Lieutenant.—C. Benjamin; T. W. Mountjoy; M. M. S. Smith; H. M. Griffiths.

Reunion

THE Clarence Hotel, Whitehall, London, will be the venue for No. 524 Squadron's reunion on February 23rd, at 6.30 p.m. Particulars from Mr. B. Haller, Land of Green Ginger, Hull.

THE INDUSTRY

REWARD FOR MERIT: At the Blackburn and General Aircraft prize-giving (reported below): Mr. E. Turner, managing director, presents the directors' prize—a wrist-watch—to I. Carlisle, best apprentice of the year. Just discernible on the right is Mr. N. E. Rowe, who recently joined the firm as technical director.

MR. A. J. BRUNKER, B.Sc. (Eng.), A.M.I.E.E., general export manager of E. K. Cole, Ltd., has been made additionally responsible for commercial activities in the company's electronics division. Mr. Brunker will be supported by Lord Waleran, commercial manager of the division.

Brough's Bright Apprentices

AT the annual presentation of prizes to Blackburn and General Aircraft apprentices, held recently at Brough, Mr. E. Turner (managing director) said that since the inception of the presentations (this was the 21st) the total number of awards had exceeded 1,550, though, of course, there were Blackburn apprentices long before the nineteen-thirties—in fact, before the 1914-18 war. The company had always endeavoured to give the best possible training both on aircraft and engines.

Mr. N. E. Rowe (technical director) pointed out the value of a sound apprenticeship in aviation, and Mr. T. A. Wolstenholme (apprentice supervisor) reviewed the past year's successes; these included an S.B.A.C. University Scholarship to J. D. Mann, the Silver Medal of the Hull Association of Engineers to G. Shephardson, and three passes in the Part II Examination of the R.Ae.S., while E. Middleton gained the Final Certificate of the City and Guilds Machine Shop Engineering Course, seven others secured the Intermediate City and Guilds Certificate, and five gained the Diploma in Aeronautics.

Mr. W. A. Hargreaves (works director), presenting the awards, emphasized that design was of no avail without production engineers, and *vice versa;* Mr. E. Harrison (acting principal of the Hull Technical College) referred to the fact that since 1922, when an aeronautical engineering course had started at the Hull Technical College, over 200 of the company's apprentices had gained their National Certificates, 50 their Higher National, and 100 the Diploma in Aeronautics; and Mr. H. Rochester (headmaster of Riley High School, Hull) had some pertinent things to say about the ambitions of boys at school-leaving age.

Mr. Turner, in his closing remarks, made a noteworthy point: In the United States, he said, 23 per cent of students were engaged on cultural studies as opposed to the pursuit of science, but in this country the figure was 53 per cent. Surely, he thought, this indicated a gross neglect of science in Britain.

Williamsons Celebrate

ON the evening of January 18th, the Williamson Manufacturing Co. Ltd., the well-known makers of air-survey cameras and other photogrammetric equipment, held their 46th annual dinner. Mr. C. M. Williamson, C.B.E., F.R.P.S., the chairman and managing director, presided but—for the first time in 39 years—Mrs. Williamson was unable to be present.

The supply of Williamson air cameras to the Service goes back to the early days of the Royal Flying Corps. Their slipstream-driven LB type of 1916-17, fed by boxes of 18 5in x 3¼in plates, was a very sound instrument, quite equal in its time to the Williamson O.S. C-2 film camera, which now has a world wide reputation for air survey work.

To Speed Production

AS recently announced in these pages, the Third Mechanical Handling Exhibition and Convention are to be held at Olympia, London, from June 4th to 14th, and some 170 firms are to display their products.

Among speakers at the Convention will be members of the Mechanical Aids Team which went to America last year: they are to discuss *Case Histories of Mechanical Handling*.

Tickets for the Convention will be available only on the day of the discussion concerned, but intending visitors are invited to ask the organizers (Associated Iliffe Press, Dorset House, Stamford Street, London, S.E.1) to reserve tickets for them.

IN BRIEF

Northern Aluminium Co., Ltd., announce that their Manchester area sales office is now at 75, Piccadilly, Manchester, 1 (Central 5479).

* * *

Two recent additions have been made to the many aeronautical subjects listed in the P.F.B. catalogue of 35 mm and 16 mm documentary films (Petroleum Films Bureau, 29, New Bond Street, London, W.1); they are *Air Parade* (progress of aviation from 1909) and *Model Flight* (compiled with the assistance of the S.M.A.E.).

AN ATTACHÉ LOOKS IN: Col. de Porta, recently appointed Italian Air attaché in London, is shown the gyro unit of the Hughes GM2F compass system during a visit to the Barkingside, Essex, factory of Kelvin and Hughes, Ltd. Among other equipment he inspected were the firm's latest turn-and-slip instruments and the Mk 3 periscopic sextant.

An addition to the cable equipment manufactured by Hellerman Electric, Ltd., Crawley, Sussex, is a P.V.C. flag-type marker. Having a large surface to receive the marking, these flags can be fitted on cables and wires down to 1/32in o.d.

* * *

Dr. Eric Warlow-Davies is named as general manager and chief engineer of Rolls-Royce' Montreal, Ltd., and Mr. David Boyd, O.B.E., is to be production manager. Mr. J. H. Tivey, formerly general manager, will remain deputy general manager in charge of spares and service for several months before returning to this country.

* * *

An admirably prepared brochure describing the Lockheed organisation's new three- and five-year apprenticeship schemes includes colour-charts showing exactly how apprentices on the various courses progress from initial selection to ultimate opportunities of entering responsible posts. Prospective entrants may obtain copies from the Education Officer, Lockheed Hydraulic Brake Co., Ltd., Leamington Spa.

* * *

British Insulated Callender's Cables, Ltd., and the Loewy Engineering Company, Ltd., have formed a new company to utilize their knowledge, patents and development work in the field of aluminium sheathed cables. The name of the new company is Alsheath, Ltd., and its offices are at Norfolk House, Norfolk Street, London, W.C.2. The experience of B.I.C.C. as cable-makers and of Loewy Engineering as builders of extrusion presses will be incorporated in new plant for the cable-making industry in the United Kingdom and for export.

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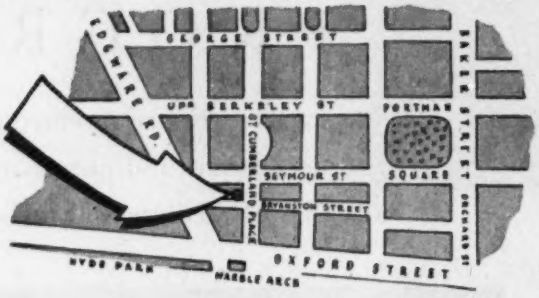

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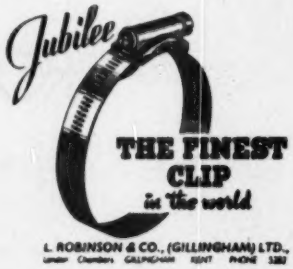

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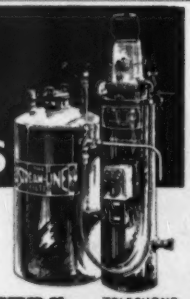

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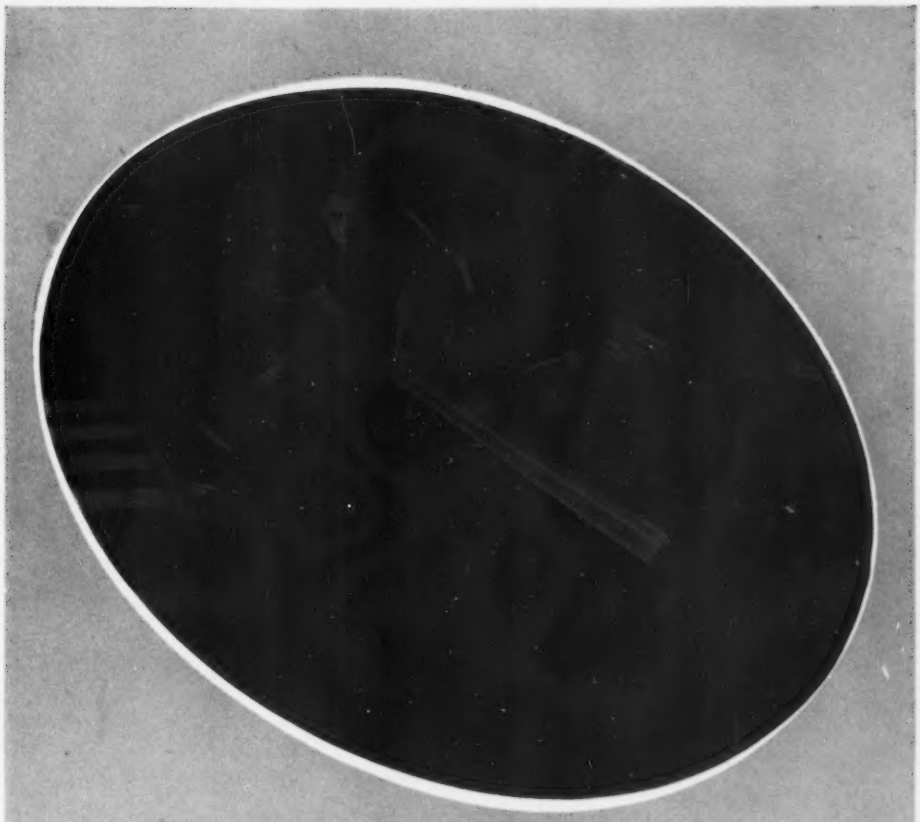

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